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REVISION OF NORTH AMERICAN SPIDERS OF THE FAMILY LYCOSIDÆ.

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INTRODUCTION.

The *Lycosidæ* form one of the most successful of all families of spiders. Their common names of wolf and running spiders indicate their dominant traits. All live close to the earth, roaming freely and boldly, and with rare exceptions capturing their prey by the chase rather than by means of webs or other strategy. They are among the most familiar and widely distributed of spiders. The *Piratas* and

most of the small and excessively active *Pardosas* keep close to the water, when alarmed running out freely over the surface, in adaptation to which action their tarsi are specially modified in the arrangement of hairs and bristles. The larger *Lycosas* may mingle their colors with those of the dried leaves and twigs of the woods, lurk beneath the stones of roadside and field, wander in the open or burrow in the sand of the seashore or the soil of the plain. Everywhere they are familiar; not because of large number of species, nor because of their bold open habits, but especially because of the excessive abundance of individuals resulting from successful adaptation to conditions widely available.

All true spiders depend upon living animals, mostly insects, for food. Since they ingest only the body juices of their prey, what seems at first an amazing quantity of insects is required to satisfy their nutritive needs. Most spiders have met this requirement through the development of instinct and skill, accompanied of course by those structural modifications necessary for their effective exercise, in the construction of webs. The line of divergence of the *Lycosidæ*, however, has been in the direction of capacity for taking prey by the chase. The high arched cephalothorax and the long stout legs plainly bespeak strength and speed. But strength and speed alone would be quite ineffective without the simultaneous development of the sensory system, to enable the spiders to detect and with some certainty to follow their prey. Such development has affected strongly the sight; other senses, excepting touch, being seemingly but feebly developed. This is manifest in the differentiations in size and arrangement of the eyes. It has been shown that the arrangement of the eyes is such as to make the animal aware of movements within its limit of vision in front, at the sides and through a considerable arc behind, the arc directly forward being covered particularly well. The eyes fall very clearly in three rows. The first row, situated across the lower part of the face, is composed of four small eyes placed in different planes; the second of two eyes, large in size and directed antero-laterally; the third of two medium-sized eyes situated farther back on the *pars cephalica* and directed latero-caudally. This arrangement of the eyes is apparently associated with the characteristic elevation of the *pars cephalica*. The high dorsally narrowed cephalothorax and the placement of the eyes in three distinct rows as described are features by which the *Lycosidæ* are usually to be detected at a glance. Other characters serving with those mentioned to distinguish members of this family are the three claws of the tarsi, the notching of the trochanters at the outer end

beneath, and the excavation of the posterior piece of the superior lorum of the abdominal pedicel.

Most of the wolf spiders build no webs of any kind for ensnaring their prey. A few forms (*Sosippus*, *Hippasa*), however, construct sheet webs over stones and low bushes with central, funnel-like retreats, much like those of some *Agelenidæ*. In these web-constructing forms there is a strong development of the superior spinnerets, similar to that in the latter family.

The females without exception enclose their eggs in cocoons, which they carry about attached to their spinnerets until the young hatch. After hatching the young are carried about on the back of the parent until able to shift for themselves with some degree of safety. In making these cocoons the spiders first spin upon the ground a circular disk, which they enlarge usually until its diameter is about equal to the length of their bodies. A suitable scaffolding of threads is constructed preliminary to the spinning of the disk. After the basal disk is completed the spider presses out from the genital ducts upon the center of the disk a drop of viscid fluid, into which the eggs are allowed to fall. She then spins over the eggs a covering sheet, fastening its edges to the basal disk. The cocoon is then cut loose from its attachments by means of the chelicerae, the ragged edges are neatly taken up and fastened to the wall of the cocoon, and over the whole fresh threads are spun while the cocoon, held beneath the cephalothorax by means of the third legs, is rotated by chelicerae and palps. The result is a neat egg-sac, lenticular in form and showing a distinct seam (*Pardosa*), or spherical in form and either with a less distinct seam at equator (*Pirata*) or without a seam evident (*Lycosa*).

As a rule the Lycosids born during any season pass the succeeding winter in the half-grown condition, not reaching maturity until the following summer or late spring. The smaller members of the family live but a single year, and during this time build no retreats for themselves. The larger Lycosas, however, are known to live for several years. Many of these build burrows, which they close upon the approach of winter by means of plugs or lids. These burrows may be mere shallow, nest-like excavations loosely lined with silk or may be deeper, more skilfully executed tunnels. In some cases a rampart or turret is built up about the opening of the burrow, apparently to prevent the drifting in of débris, etc. This rampart may be composed of particles of sand or earth, or of pieces of straw, grass or sticks, superposed and bound together by means of silk. The same burrow may be occupied by a spider for several seasons, the occupant remodel-

ling the burrow if injured by accident, or enlarging it if outgrown (see *L. fatifera*, etc.).

The number of species and genera of *Lycosidæ* is very much smaller than would at first thought seem probable. These bold wanderers, with their strong, long legs, the black spines upon which standing out threateningly during excitement suggest their aggressiveness, spread out persistently in every direction. Isolation of any part of a species for a long time would be expected to be rare, and the establishment of distinct forms, therefore, so far as dependent upon this factor, infrequent. There are comparatively few species of wide distribution, rather than a large number of limited range. This wide range of species is accompanied naturally by a great deal of fluctuating variability in many of their features. A result has been a surprisingly large number of synonyms, consequent upon examinations of limited number of specimens from widely separated localities. For example, species that range from New England to the West and far South become lighter and lighter in coloration. In several species the brightly colored individuals that prevail in Texas would appeal to one at first as surely specifically distinct from the darker forms of the North. But all gradations are found when sufficient material is studied, especially in that from intermediate regions, while apparently no significant differences at all appear in less variable structural features. Important variations are discussed in detail in the present work under the respective species.

In this connection a main source of difficulty has been, indeed, the placing of too great reliance upon purely relative characters that undergo greater variation than has been recognized. Even in the treatment of genera this purely relative nature of the characters commonly used has left much room for diversity in opinion and usage. It is not, therefore, really surprising to find that genera accepted without question by one student are unhesitatingly denied by others. Some genera that have from time to time been proposed are clearly artificial, having, it would seem, been erected with a view to convenience rather than in an effort to express genetic relationship.

All of the characters that have been commonly used in separating, e.g., *Pardosa* and *Lycosa*, somewhere become uncertain, the result having been many incorrect references of species. And so, also, is it with other genera. My own studies of the *Lycosidæ* long ago convinced me that the clearest and most definite characters for limiting not only the species but the genera of the *Lycosidæ* as well, are those presented in the copulatory organs. In the present contribution much reliance

is placed upon these characters as indices of relationship. They have not previously been used in the definition of genera. It has been necessary to introduce a provisional terminology, perhaps sufficient for present descriptive purposes, for parts of the copulatory organs. Careful comparative studies on the morphology of the palpal organs of male spiders are much needed to give us a consistent general terminology.

As here considered the portion of the family *Lycosidæ* in the fauna of America north of Mexico includes eight genera: *Allocosa*, *Pardosa*, *Schizocosa*, *Lycosa*, *Trabea*, *Sosippus*, *Sosilaus* and *Pirata*. *Lycosa* is more comprehensive than the other genera and its species fall into a number of natural but mostly intergrading groups. Of these groups one *in part* corresponding to *Trochosa* of some authors is most divergent and compact. (See further under *Lycosa*.) Altogether, in the neighborhood of one hundred and fifty specific names have been erected for the forms under these genera; but of these not more than half are really "good." The species that I have been able to regard as distinct and recognizable are distributed among the genera as follows: *Trabea*, *Sosippus* and *Sosilaus*, each with one; *Allocosa*, five; *Schizocosa*, three; *Pirata*, nine; *Pardosa*, seventeen; *Lycosa*, thirty.

Of the material studied mention should be made first of the section of *Lycosidæ* in the rich collection of *Araneæ* at Cornell University, for the privilege of using which and for other unfailing courtesies I am deeply obliged to Prof. J. H. Comstock. The Cornell collection includes not only species from New York State and other parts of the North, but also a good representation of forms from the South and a number of species from the West. My own collection consists of specimens collected in California, Utah and New York by myself, and of a large number from many different localities obtained through others. Among those to whom it is a pleasure to make acknowledgments for specimens are the following: M. Simon, France (specimens from Florida); Rev. F. O. P. Cambridge, England; Mr. B. H. Guilbeaux, Louisiana; Miss Annie Jones, Georgia; Mr. A. M. Bean, Iowa; Mr. C. O. Crosby, New York; Mr. T. H. Scheffer, Kansas; Mr. G. W. Peckham, Wisconsin; Dr. O. M. Howard, Utah; Prof. T. H. Montgomery, Texas. For the loan of specimens and collections for study I owe my thanks to Mr. J. H. Emerton, Boston; Mr. Samuel Henshaw, of the Museum of Comparative Zoology, Boston; Prof. C. M. Weed, New Hampshire; Prof. John Barlow, Rhode Island; Mr. Charles Fuchs, of the California Academy of Sciences; Prof. M. T. Cook, Indiana; and Dr. W. M. Wheeler, of the American Museum of Natural History, New York.

For the privilege of studying the Marx collection in the U. S. National Museum and various types in his own private collection, I am much indebted to the courtesy of Mr. Nathan Banks.

LIST OF DESCRIBED NORTH AMERICAN LYCOSIDÆ.

GENERA.

ALLOCOsa Bks.	PIRATA Sund.
<i>Arctosa</i> C. Koch = <i>Lycosa</i> Latr.	<i>Scaptocosa</i> Banks = <i>Geolycosa</i>
<i>Aulonia</i> Emerton (<i>aurantiaca</i>) =	Mtg.
<i>Trabea</i> Simon.	SCHIZOCOSA Chamb.
<i>Geolycosa</i> Mtg. = <i>Lycosa</i> Latr.	SOSILAUS Simon.
<i>Leimonia</i> C. Koch = <i>Pardosa</i> C.	SOSIPPUS Simon.
Koch.	TRABEA Simon.
LYCOSA Latr.	<i>Trochosa</i> C. Koch = <i>Lycosa</i> .
PARDOSA C. Koch.	

SPECIES OF ALLOCOsa.

degesta Chamberlin.	<i>nigra</i> (Stone) = <i>rugosa</i> (Keys.).
evagata , sp. nov.	parva (Banks).
? <i>exalbida</i> Becker.	rugosa (Keyserling).
funerea (Hentz).	<i>sublata</i> (Montgomery) = <i>funerea</i>
	(Hentz).

SPECIES OF LYCOSA.

albohastata Em.	frondicola Em.
<i>antelucana</i> Mtg. = <i>apicata</i> Bks.	fumosa Em.
apicata Bks.	grandis Bks.
arenicola Sc.	gulosa W.
aspera Hentz.	helluo W.
avara Keys.	<i>helvipes</i> Keys. = <i>helluo</i> W.
<i>babingtonii</i> Bl. = <i>helluo</i> W.	<i>inhonesta</i> (Keys.) = <i>aspera</i> H.
baltimoriana Keys. (var.)	<i>insopita</i> Mtg. = <i>gulosa</i> W.
beanii Em.	<i>immaculata</i> Bks. = <i>aspera</i> H.
<i>brunneiventris</i> Bks. = <i>kochii</i> Keys.	kochii Keys.
carolinensis H.	<i>latifrons</i> (Mtg.) = <i>fatifera</i> H.
cinerea Fab.	lenta H.
coloradensis Bks.	<i>lepida</i> Keys. = <i>erratica</i> H.
<i>crudelis</i> Bks. = <i>helluo</i> W.	<i>littoralis</i> H. = <i>cinerea</i> Fab.
<i>communis</i> Mtg. = <i>erratica</i> H.	<i>maritima</i> H. = <i>cinerea</i> Fab.
<i>epigynata</i> Mtg. = <i>gulosa</i> W.	<i>milberti</i> W. = ? <i>carolinensis</i> W.
erratica H.	<i>missouriensis</i> Bks. = <i>fatifera</i> H.
<i>exitiosa</i> Bks. = <i>aspera</i> .	modesta Keys.
fatifera H.	<i>modesta</i> Th. = <i>frondicola</i> Em.
floridana Bks.	<i>nidicola</i> Em. = <i>helluo</i> W.
floridiana Bks.	<i>nidifex</i> Mx. = <i>arenicola</i> Sc.
	<i>nigroventris</i> Em. = <i>frondicola</i> Em.

oblonga Bks. = *aspersa* H.

perdita.

permunda Chamb.

pikeri Mx. = *arenicola* Sc.

pu dens Mx. = *frondicola* Em.

pictilis Em.

pilosa Gir. = *carolinensis* W.

philadelphiana W., invalid.

polita Em. = *rubicunda* Keys.

pratensis Em.

pulchra (Keys.) = *gulosa* W.

purcelli Mtg. = *gulosa* W.

propinqua Bl. = *erratica* H.

punctulata H.

quinaria Em.

riparia Hentz.

rubicunda Keys.

rufiventris Bks. = *avara* Keys.

ruricola H. = *lenta* H.

sepulchralis Mtg. = *modesta* Keys.

sagittata H. = *erratica* H.

scalaris Th. = *erratica* H.

scutulata Htz.

sayi W. = ? *helluo* W.

similis Bks = *helluo* W.

texana Mtg. = *carolinensis* W.
(var.)

tigrina McC. = *aspersa* H.

vafra C. K. = ? *helluo* Walck.

vulpina Em. = *aspersa* H.

WALCKENAER'S NAMES OF SPECIES OF LYCOSA OF THE ABBOTT AND BOSC MANUSCRIPTS.

(Described in Ins. Apt., Vol. 1.)

animosa.

avida.

discolor.

encarpata.

grossipes.

georgiana.

georgicola.

impavida.

infesta.

mordax.

suspecta.

triton.

vehementer.

These names are all invalid, the descriptions having been based on the unpublished drawings of Abbott and Bosc.

SPECIES OF PARDOSA.

albomaculata Em. = *grænlandica*
Th.

annulata Bks. = *saxatilis* Bl.

atra Bks.

banksi Chamb.

brunnea Em. = var. of *modica* Bl.

californica Keys.

canadensis Bl. = *milvina* H.

coloradensis Bks. = *sternalis* Th.
(Jrs.).

distincta Bl.

dorsalis Bks. = *mackenziana* Keys.

dromoea Th. = *grænlandica* Th.

emertoni Chamb.

flavipes Keys. = *milvina* Htz.

floridana Bks. = *banksi* Chamb.,
var.

fuscata Th. = *modica* Bl.

furcifera Th. = *modica* Bl.

glacialis Th. = *modica* Bl.

grænlandica Th.

impavida Th. = *xerampelina* Keys.

indigatrix Th. = *grænlandica* Th.

intrepida Marx = *grænlandica* Th.

iracunda Th. = *grænlandica* Th.

labradorensis Th.

lapidicina Em.

longispinata Tullg.

luteola Em. = *distincta* Bl.

littoralis Bks. = *banksii* Chamb.

mackenziana Keys.

mercurialis Mtg. = *lapidicina* Em.

milvina Htz.

minima Keys. = *saxatilis* H.

modica Bl.

mœsta Bks.

montana Em. = *xerampelina* Keys.

nigropalpis Em. = *milvina* H.

pallida Em. = *emertoni* Chamb.

parvula Bks. = *saxatilis* H. (var.)

pauxilla Mtg.

saxatilis Htz.

scita Mtg. = *milvina*.

sinistra Th. = *grænländica* Th.

sternalis Th.

tachypoda Th. = *xerampelina*
Keys.

texana Bks. = *lapidicina* Em.

tristis Th. = *grænländica* Th.

uncata Th. = *mackenziana* Keys.

venusta Bks. = *lapidicina* (Jrs.).

xerampelina Keys.

SPECIES OF *PIRATA*.

agilis Bks. = *montanus* Em.

aspirans Chamb.

bilobata (Tullg.).

elegans Stone = *montanus* Em.

exigua Bks. = *minuta*.

febriculosa Becker.

humicolus Montg.

insularis Em.

liber Montg. = *insularis* Em.

marxi Stone.

minuta Em.

montana Em.

montanoides Bks. = *insularis* Em.

nigromaculatus Montg. = *montanus* Em.

prodigiosa Keys.

piratica (Cl.) var. *utahensis*, new.

sedentarius Mtg. = *febriculosa*
Beck.

wacondana Schef. = *febriculosa*
(Beck.)

SPECIES OF *SCHIZOCOSA*.

bilineta (Emerton).

charonoides Mtg. = *saltatrix* H.

gracilis (Banks) = *saltatrix* H.

humilis (Banks) = *saltatrix* H.

ocreata (Hentz).

ocreata pulchra (Montg.) = *bi-*
lineata.

relucens (Montg.) = *venustula*
(Hentz).

rufa Keys. = *ocreata* Hentz (♀).

saltatrix

stonei Montg. = *ocreata* Hentz.

venustula (Hentz) = *saltatrix* H.

verisimilis (Montg.) = *saltatrix* H.

SPECIES OF *SOSILAUS*.

spiniger Simon.

SPECIES OF *SOSIPPUS*.

floridanus Simon.

SPECIES OF *TRABEA*.

aurantiaca (Emerton).

THE FAMILY LYCOSIDÆ.

Cephalothorax elongated, much longer than wide, attenuated anteriorly. The *pars thoracica* high and subprismatic, narrow above and oval

in outline, with the posterior border truncate and concave at the middle; a distinct fine median sulcus which is rather long always present, as are also more or less distinctly impressed radiating striae. *Pars cephalica* elevated and arched, distinctly separated from the *pars thoracica* by cervical furrows which unite at an angle at the median dorsal line, these more rarely indistinct above; *pars cephalica* with front truncated or more or less obtusely rounded. The face high, trapeziform or, less commonly, with the sides subparallel; in profile vertical, or at least very steep.

Eyes all of the diurnal type; always distinctly arranged in three rows, of which the first is composed of four eyes and is located upon the lower part of the face, the second composed of two eyes at the upper part of the face or semidorsal in position, and the third, also composed of two eyes, in a strictly dorsal position; eyes of the first row small and comparatively close together, in a straight, procurved or rarely recurved row, the lateral eyes on more or less evident tubercles and with their visual axes directed antero-ventrally; eyes of second row very large, occupying a transverse space, in most cases wider than that of the first row, less commonly of the same length or shorter, their visual axes directed antero-laterally; eyes of third row large, almost always more widely separated than those of the second row, with which they thus outline a trapeziform area (quadrangle of posterior eyes), their visual axes directed more or less caudo-laterally. *Clypeus* comparatively narrow, always narrower than the width of the area outlined by the first and second rows of eyes (quadrangle of anterior eyes).

Chelicerae long and robust, always vertical in position in both sexes; at base a well-marked and rather large lateral condyle; both upper and lower margins of furrow armed, the upper with two or, more commonly, with three teeth, of which the median is much the largest, and the lower margin with from two to four stout conical teeth; posterior face always marked with a distinct oblique stria, along the inner side of which, especially in the middle region, is a well-developed, often dense, pilose band; upper margin of furrow bordered with a subdense pilose band or fringe.

Labium free; the ventral surface flat or, much more commonly, convex; more or less attenuated anteriorly, with front margin truncate or obtuse; from longer than wide to wider than long; much shorter than the endites. *Endites* longer than wide, more or less excavated within and fitting over the sides of the labium, externally rounded and never much narrowed at base; erect, never obliquely inclined; dorsal surface flat or a little concave; distally the supra-external border with

a fine serrulate line or serrula; supero-internal border with a dense pilose band or scopula.

Sternum longer than wide; large, subcordiform, being truncated in front, rounded at the sides and attenuate to a point caudally.

Legs long or moderately long, the fourth longest, then the first, the third shortest in the great majority of cases; but there are exceptions in which the third legs are longer than the second, and others in which the second are longer than the first. The femora, tibiæ and metatarsi and usually also some or all of the patellæ armed with spines; the anterior tibiæ with three pairs of spines beneath, less commonly with two (*Pirata*), and sometimes with as many as five (*Sosilaus*); these and other spines of the anterior legs often much reduced and sometimes absent.

In some small species the tarsi are beneath, all simply and rather sparsely setose, but in most they are at least in part more or less provided with scopulæ composed uniformly of fine, flat lanceolate and slenderly pointed hairs, never of distally enlarged hairs; in the smaller species these scopulæ may be present only along the sides of the ventral faces of the anterior tarsi; but in the larger species (*Sosippus* and most *Lycosas*) the entire ventral surface of the anterior tarsi is densely scopulate, and the metatarsi are usually similarly or less densely scopulate, and the tibiæ are also sometimes scopulate distally; in these larger forms the posterior tarsi are scopulate, but have their scopulæ divided by a median line or band of setæ; never with dense fasciculæ at base of claws. Tarsi bearing three claws, of which the superior are strong and broad basally, and bear a series of teeth from five to seven, rarely more, in number, these being mostly confined to the basal half of the claws; the unpaired claw small, bent abruptly downward, almost always naked, rarely with a single tooth. Trochanters invariably notched or excavated at distal end beneath.

Superior *lorum* of the pedicel of the abdomen composed of two principal, very unequal pieces, of which the smaller posterior one is truncated or somewhat concave behind, and in front is notched or excavated for the reception of the angularly or roundly attenuated posterior part of the longer anterior piece; at each side of the principal plates is a slender, anteriorly attenuated piece.

Spinnerets six in number; the anterior ones short and relatively stout, contiguous or subcontiguous; the posterior more or less separated from each other, mostly more slender than the anterior and either of the same length or longer, composed of two articles, of which the second is short and rounded and usually subject to retraction within

the first, or less commonly longer and conical (*Sosippus*); median pair slender, of moderate length.

Body clothed with simple *hair*, or more rarely with some of plumose type intermixed (*Sossipus* and some *Pardosas*).

Genital plate or *epigynum* of the female mostly simple; either a simple unfurrowed plate or a plate depressed or furrowed longitudinally and with the depressed area divided by a ridge-like elevation (*guide*), which in the large majority of cases extends laterally on each side at its posterior end. The transverse portion of the guide often (*Lycosa* sens. str.) distinctly more elevate than the septal portion immediately in front of it and extending on each side to behind the openings of the spermathecae; median piece of guide posteriorly and the transverse pieces on anterior side with the upper free edges mostly more or less extended horizontally in plate-like expansions, which are usually narrow but may be wide (lateral plates or *alæ* of guide).

Palpus of the male long, differing uniformly from that of the most nearly related families (e.g., *Pisauridae* and *Agelenidae*) in never having femur, patella, or tibia armed with any manner of process or apophysis. Tarsus or cymbium comparatively simple, boat-shaped; completely covering the bulb, the alveolus occupying usually not more than two-thirds of the ventral area; terminal part of the tarsus acuminate and bearing one, two, or rarely three mostly stout, always untoothed spines (transformed claws), occasionally unarmed. Bulb comparatively simple and compact; embolus only rarely exerted, in most lying upon a special fold (*lectus*) at front of the larger basal lobe or division, this fold in many with a lobe (*auricula*) extending forward in front of its exterior end; lobe of the conductor bearing one to several chitinous processes (*tenacula*); either an erect and conspicuous apophysis (*Pirata*) or transverse, and appressed; basal division of bulb bearing strongly chitinized fold or apophysis (*scopus*) in a median (*Pardosa*) or exterior position (*Lycosa*), or with such fold or apophysis absent or but weakly developed (*Pirata*), its absence or weak development being correlated with the absence of furrow and guide in the epigynum of the female; a chitinous plate or area (lunate area) at base of bulb practically always exposed, the area being of varying size in the different genera, but of quite constant relative extent and position in each.

The most simple and generalized condition is shown in *Pirata*.

Syn.—1817. *Citigrade* Latr. (ad. max. part.), in Cuvier, Règne Animal, 3, p. 95.

1823. *Cursores* Sund. (ad. max. part.), Gen. Aran. Suec., p. 20.

1825. *Citigrade* Latr. (ad. max. part.), Fam. Nat. de Règne Animal, p. 316.

1833. *Lycosides* Sund. (ad. max. part.), Comp. Arachn., p. 25.

1850. *Lycosides* C. Koch (ad. max. part.), Übersicht d. Arachn. Syst.
 1852. *Venatores* Dolesch. (ad. max. part.), Syst. Verz. Oesten. Sp., p. 8.
 1869. *Lycosoidæ* Thorell (ad. max. part.), On European Spiders, p. 188.
 1876. *Lycosidæ* Simon (excl. *Dolomedes* and *Ocyale*), Arachn. Françe, 3, p. 223.
 —. *Lycosoidæ* Keyserling (excl. *Dolomedes* and *Ocyale*), Verh. z. b. Ges. Wien, p. 610.
 1877. *Lycosoidæ* Thorell, Bull. U. S. G. S. Terr., 3, p. 504.
 1885. *Lycosidæ* Em. (excl. *Dolomedes*, *Oxyopes* and *Ocyale*), Trans. Conn. Acad. Sci., 6, p. 481.
 1890. *Lycosidæ* Marx (excl. *Dolomedes* and *Ocyale*), Proc. U. S. N. M., 12, p. 560.
 1892. *Lycosidæ* Banks (excl. *Pisauridæ*), Can. Entomologist, xxiv, p. 97.
 1898. *Lycosidæ* Simon, Hist. Nat. Araign, 2, p. 317.
 1903. *Lycosidæ* Comstock, Classif. of N. A. Spiders.
 1905. *Lycosidæ* Banks, American Nat., p. 300, 318.

KEY TO NORTH AMERICA GENERA OF LYCOSIDÆ.

1. Anterior tibiæ armed beneath with five pairs of very long spines; anterior eyes subcontiguous, in a recurved row clearly longer than the second, *SOSILAUS*.
 Anterior tibiæ armed beneath with less than five pairs of spines; anterior row of eyes straight or procurved, 2.
2. Lower margin of furrow of chelicera armed with four stout conical teeth, *SOSIPPUS*.
 Lower margin of furrow of chelicera armed with two or three teeth, never with four, 3.
3. Anterior row of eyes very strongly procurved, the median eyes much farther from the lateral than from each other, *TRABEA*.
 Anterior row of eyes not strongly procurved, the median eyes little or mostly not at all farther from the lateral than from each other, 4.
4. Cephalothorax glabrous or very nearly so, smooth and shining, dark in color and without definite light markings, *ALLOCOSEA*.
 Cephalothorax not glabrous, when but sparsely pubescent having a distinct light colored median stripe, 5.
5. Distal pair of ventral spines of anterior tibiæ never apical in position; cephalothorax with a median pale band enclosing in its anterior portion a dark V-shaped mark. (Epigynal plate unfurrowed, *i.e.*, without a guide; true scopus absent or but faintly indicated in male palpus), *PIRATA*.
 Distal pair of ventral spines of anterior tibiæ apical in position; median pale band of cephalothorax when present not enclosing anteriorly a dark V-shaped mark. (Epigynum with a distinct guide; scopus well developed), 6.
6. Scopus median in position and more or less erect; guide of epigynum weakly or not at all developed anteriorly, the spermatheca opening into comparatively deep, open, basin-like foveæ, which when continued forward as furrows are distinctly less depressed anteriorly; labium wider than long with basal excavations short, *PARDOSA*.
 Scopus exterior in position; guide of epigynum well developed

anteriorly; labium longer than wide with the basal excavations long, 7.

7. Transverse arms of guide divided from the distal end more or less mesally; auricula of lectus very long, reaching or nearly reaching the anterior margin of alveolus; the embolus distinctly elbowed at base of auricula; conductor conspicuously elevate and usually more or less produced into a horn-like process extending beyond front margin of alveolus, . SCHIZOCOSA.

Transverse arms of guide not divided from apex mesally; auricula of moderate size or small, not attaining front of alveolus; embolus evenly curving, not elbowed at base of auricula; conductor not conspicuously elevate or produced above into a horn-like process extending beyond front margin of alveolus,

LYCOSA.

PARDOSA C. Koch, 1848.

(Subgenus sub LYCOSA, Die Arachn., Vol. 14, p. 100.)

Entire body densely clothed with pubescence. Anterior tibiae armed beneath with three pairs of *spines*, of which the basal and median pairs are very long, much longer than the diameter of the joint, the third pair apical in position and reduced in size. Anterior row of *eyes* always shorter than the second and procurved; *eyes* small and subequal or with the median a little larger; median eyes nearly always a little farther from each other than from the lateral; clypeus high, twice as wide as the diameter of an anterior lateral eye; eyes of the second row large and divergent, situated at the outer angles of the face above, their diameter or more apart; quadrangle of posterior eyes trapeziform, wider behind than in front. *Labium* at least as wide as long, usually wider; basal excavation short, only very rarely more than one-fourth of the total length of labium. *Spinnerets* short, the posterior pair a little longer than the anterior, the apical segment being short and rounded. *Epigynum* with a distinct guide which is but weakly or not at all developed anteriorly; the openings of the spermatheca protected; the spermathecum on each side opening into a relatively large and deep fovea or pit, the furrows becoming narrower and shallower anteriorly. Posterior lobe of *male palpus* bearing a scopus in a median position; scopus more or less erect, free except at base where it has a spur or process on the exterior side; scopal fold low; when a true lectal fold is indicated never showing an auricle or forwardly directed lobe; lower furrow of conductor relatively extensive, bearing at its inferior margin a variously formed and often lobed or dentate tenaculum.

Syn.—1804. *Lycosa* Latreille (ad. part.), Nuov. Dict. Hist. Nat., 24, p. 135.
1832. *Lycosa* Hentz (ad. part.), Sill. J. Sci. Arts, 21, p. 106.

1842. *Lycosa* Hentz (ad. part.), J. Bost. Soc. N. H., 4, p. 228.
 1848. *Lycosa* subg. *Leimonia* C. Koch, Die Arach., 14, p. 99.
 ———. *Lycosa* subg. *Pardosa* (nom. preocc.), *ibid.*, p. 100.
 1875. *Lycosa* Hentz. (ad. part.), Sp. U. S., pp. 11 and 24.
 1876. *Pardosa* Simon, Arachn. Fr., Vol. 3.
 1876. *Lycosa* Keyserling (ad. part.), Verh. z. b. Ges. Wien., p. 610.
 1877. *Lycosa* Thorell, Bull. U. S. G. S. Terr., 3, p. 504 *et seq.*
 1885. *Pardosa* Emerton, Tr. Conn. Ac. Sci., 6, p. 494.
 1898. *Pardosa* Simon, Hist. Nat. Araign., 2.
 1902. *Pardosa* Montgomery (ad. part. max.), Proc. Ac. Sci., Phila., p. 536.
 1903. *Pardosa* Comstock, Classif. of N. A. Spiders.
 1904. *Pardosa* Chamberlin, Can. Ent., xxxvi, p. 176.

Pars cephalica moderately narrow, the sides steep, gently declined anteriorly; face elevated, its sides straight and very steep, subvertical. Quadrangle of posterior eyes one-fourth or more the length of the cephalothorax. Seen from above the posterior eyes are at most but very little more than their diameter removed from the margins of *pars cephalica* (Pl. VIII, fig. 2). *Chelicerae* in the great majority of cases with but two teeth on the upper margin of the furrow, the lower margin with three, of which the third is usually much reduced (Pl. VIII, fig. 1). *Legs* long and especially the metatarsi and tarsi slender. Anterior tarsi scopulate, laterally the median ventral face occupied by a setose band (Pl. VIII, fig. 7), posterior tarsi simply setose; metatarsus of fourth leg relatively long, most commonly longer than the tibia + patella (especially so in ♂), more rarely of same length or a little shorter; tibia + patella of fourth legs always longer than the cephalothorax. The *color* markings frequently due in large part to the arrangement of the pubescence in spots and streaks without corresponding marks in the tegument, such markings, of course, being evident only in the living or dry specimens. The cephalothorax in this genus has always a more or less evident light median stripe of a characteristic dagger form. In nearly all species, although the markings may be much obscured in some, there is on the dorsum of the abdomen a pale basal mark which runs to a point near the middle, each side of the apex and also usually each side of the middle of which is an angular pale spot, having a dark dot at its center; posteriorly a series of such ocellate spots more or less united at the middle line into chevrons.

Spiders of small or less commonly of medium size, all characterized by excessive agility. The males are commonly smaller than the females; but do not differ much in coloration. As in *Lycosa* and other genera, however, the anterior legs of the male are often distinguished by some peculiar development of color structure.

Pardosas build no retreat, wandering about during the cocooning

season as well as at other times. The cocoon is more or less lenticular in form, and shows a distinct seam about the equator, along which the break is made when the spiderlings issue to mount the parent. The cocoon is typically greenish-yellow or greenish-black, but only very rarely white. The individuals of this genus rarely live more than one year.

KEY TO SPECIES OF *PARDOSA*.

Females.

1. Epigynal plate or area widest at anterior end, distinctly narrowing posteriorly; guide wider anteriorly than toward apex (Pl. XIV, fig. 3), *xerampelina* (Keys).
Not as above, 2.
2. Epigynum presenting each side of the guide posteriorly a sharply delimited, relatively small fovea as long as wide, the anterior region of epigynum scarcely depressed, 3.
Not as above, 4.
3. Posterior foveæ angular in outline; posterior ends of lateral ridges separated by a distance much greater than their width; guide behind with transverse arms (Pl. XIII, fig. 5), . . *sternalis* Th.
Posterior foveæ smoothly rounded in outline; posterior ends of lateral ridges not farther apart than their diameter; guide without transverse arms (Pl. XIII, fig. 8), *atra* Bks.
4. Lateral furrows with the shallow anterior fossæ short and narrow, behind these deepening and abruptly widely expanding, becoming widest near middle of epigynum; septum of guide elevate, its more depressed transverse arms extending into excavations in the inner face of the lateral ridges, 5.
Not as above, 7.
5. Transverse arms of guide bending backwards, septum of guide widest at posterior end, becoming gradually narrower toward the anterior end, its sides substraight or but little curving (Pl. XIV, fig. 6), *grænländica* Th.
Not so, 6.
6. Transverse arms of guide bending more or less forward; septum abruptly widest immediately behind region of anterior fossæ, from there narrowing to end (Pl. XV, fig. 3), *modica* var. *brunnea* Em.
Transverse arms bending more strongly forward; septum widest behind the middle of its length, typically expanded into a broad plate-like form over the origins of transverse arms which it usually in large part covers (Pl. XV, fig. 1), *modica* Bl. (type form).
7. Face of septum of guide abruptly expanded behind into a large nearly circular plate, the diameter of which is clearly greater than the length of the part of epigynum in front of it (Pl. XIV, fig. 1), *emertoni* Chamb.
Not so 8.

8. Epigynal area wider than long, 9.
Not so, 10.
9. Distinct lateral ridges enclosing posterior portion of guide both at sides and also behind except for short median space between ends of ridges (Pl. XV, fig. 8), *distincta* Bl.
No enclosing ridges at sides or behind, guide extending completely over margins of plate of epigynum posteriorly (Pl. XIV, fig. 5), *californica* (Keys.).
10. Over anterior and median portion of epigynum a narrow and very shallow fossa passing behind into a large transversely elliptical depression which is completely occupied by the expanded guide, the lateral ends of which lie in excavations in the side ridges (Pl. XV, fig. 5), *mackenziana* (Keys.).
Not so, 11.
11. Transverse arms of guide narrowest mesally, widening toward their outer ends (Pl. XIV, fig. 7), *lapidicina* Em.
Not so, 12.
12. Lateral plates extending along guide for much of total length of epigynum, gradually narrowing in width anteriorly, 13.
Not so, the lateral plates mostly confined to transverse arms, abruptly narrowing and extending forward but a short distance on septal piece, 15.
13. Guide becoming very narrow toward its anterior end; outer margin of epigynum presenting a small abrupt shoulder on each side just below middle (Pl. XIII, fig. 9), *pauxilla* Mtg.
Guide of moderate width at its anterior end, being much wider than the fossa at each side; outer margin of epigynum presenting no shoulder below middle (Pl. XIII, fig. 7), *banksi* Chamb.
15. Posterior foveæ clearly wider than long; septum of guide very narrow over middle region, at front end strongly expanding in fan-like form; front margin of anterior depression straight and moderately wide (Pl. XIV, fig. 9), *moesta* Bks.
Not so, 16.
16. Sides of epigynum protruding into an angle in front of middle; no distinctly defined lateral ridges in middle region of sides, the sides gradually convexly rounding from middle to outer margin (Pl. XIII, fig. 1), *saxatilis* (H.).
Sides of epigynum not angulate in front of middle; more or less distinct lateral ridges along middle region (Pl. XIII, fig. 3), *milvina* (H.).

The key to females above does not include *P. longispinata* (Tullg.) and *labradorensis* (Th.), of which specimens have not been examined by the author.

Males.

1. Scopus short and stout, not at all or but slightly longer than broad, 2.
Scopus several times longer than broad, 7.

2. Anterior depressed lobe of bulb separated into two furrows by an elevated narrow fold extending from above obliquely downward and outward, externally from its lower end being two uncate tenacula and at the corner opposite its upper end a lamellate, inflexed chitinous angle (Pl. XIV, fig. 8), . . . *lapidicina* Em.
Not so, . . . 3.
3. Anterior division of bulb presenting a large, trilobed thickening transversely across its upper border from base of embolus outward, the ends of lobes recurved over the furrow posteriorly from them (Pl. XIV, fig. 4), . . . *californica* (Keys.).
Not so, . . . 4.
4. Embolus extending across bulb almost to outer side of alveolus (Pl. XV, fig. 4, var. *brunnea*; Pl. XV, fig. 2, type form),
modica (Bl.).
Apex of embolus scarcely extending beyond scopus,
grænlantica Th.
7. Scopus extending obliquely forward and outward quite to or some distance beyond margin of alveolus, . . . 8.
Not so, . . . 10.
8. Scopus curving forward with convexity external and apex directed forward, . . . *emertoni* Chamb.
Not so, . . . 9.
9. Embolus strongly bent into an S shape; scopal spur turned forward at apex (Pl. XIII, fig. 6), . . . *sternalis* (Th.).
Embolus but little curved, extending nearly straight transversely; scopal spur turned backward at apex (Pl. XIII, fig. 2),
saxatilis (H.).
10. Scopus above bent outward and then strongly backward, becoming nearly parallel with basal part (Pl. XV, fig. 9), *distincta* Bl.
Not so, . . . 11.
11. Scopus dentate at apex; the spur nearly straight, subconical (Pl. XV, figs. 6 and 7), . . . *mackenziana* (Keys.).
Scopus not dentate at apex, . . . 12.
12. Spur short and stout, abruptly turned posteriorly at apex into an acute hook (Pl. XIII, fig. 4), . . . *milvina* (H.).
Spur cylindrical, longer, . . . *pauzilla* Mtg.

Males of the following species are either unknown or are too imperfectly known to the author to be included in the foregoing key: *atra*, *banksi*, *labradorensis*, *longispinata*, *moesta*, *xerampelina*.

Pardosa saxatilis (Hentz), 1844.

(J. Bost. Soc. N. Hist., p. 392, Pl. XVIII, figs. 9, 10.)

Female.—Sides of cephalothorax deep brown to black crossed with lighter radiating lines; a median reddish yellow band which anteriorly sends a short narrow process between eyes of the third row, behind which it abruptly widens, constricted midway between the eyes and the dorsal groove, behind which it is strongly narrowed, sides of band

in region of median groove dentate; on each side a yellow supra-marginal stripe usually divided by two or three dark cross-lines and limited below by a narrow black marginal stripe which is more or less broken into spots; clypeus yellow, with a triangular black spot below each anterior lateral eye, the apex of the spot being at the eye and the base on the front margin of the clypeus; the light part of cephalothorax in life clothed with dense white hair, that of the supramarginal stripes extending also over the black marginal lines, the light side stripes consequently appearing wider in life than in alcoholic specimens. *Chelicerae* yellow, with some dusky markings. *Labium* and *endites* and *coxae* of legs beneath yellow. *Sternum* black, usually with a narrow median pale line in front; often with a row of black dots along each lateral margin, and a central black stripe narrowed behind and anteriorly geminated by a pale line, elsewhere being yellow. *Legs* yellow with black annuli on all joints excepting the tarsi, the dark annuli of the femora wide and predominating over the yellow, those of the tibiae of same width as the yellow bands, while those of the metatarsi are distinctly narrower. *Abdomen* blackish to dark gray above, sometimes of a greenish tinge; a yellow to brown lanceolate stripe at base having at each side of its apex a similarly colored angular spot with minute black dot at its center; on posterior portion of dorsum a series of light cross-marks, each formed by the lateral confluence of from two to four spots similar to those at sides of apex of basal stripe; dorsum elsewhere with many minute light dots; sides like lateral portions of dorsum but with the light dots larger; venter yellow to light reddish brown, with a row of irregular dark and partly confluent marks along each side and a short median row of similar marks behind the epigynum; in life the abdomen is densely clothed with gray and brown hair. *Spinnerets* light brown. *Epigynum* light brown, the posterior foveæ appearing as darker blackish spots.

Cephalothorax relatively higher in front than usual, highest at third eye row, from there slanting downward to the posterior declivity, concave at the dorsal groove, plane of quadrangle of posterior eyes not much declined. *Face* as high as the length of the chelicerae or slightly higher, protruding above over its lower portion; sides slightly convex or straight, subvertical.

Anterior row of *eyes* of the usual length and curvature; anterior median eyes three-fourths their diameter apart, half as far from the lateral eyes, their diameter from eyes of second row; anterior lateral eyes three-fourths or more as large as the median, more than twice their diameter from the front margin of clypeus and than their diam-

eter from eyes of second row; eyes of second row their diameter or a little more apart; quadrangle of posterior eyes more than one-fourth the length of the cephalothorax.

Labium wider than long (4.25 : 4); basal excavation one-fourth the total length; strongly attenuated anteriorly, the sides for most of length convexly rounded, becoming straight toward anterior angles; front margin slightly convexly rounded.

Legs with the metatarsus of the fourth pair clearly longer than the tibia + patella; tibia + patella of the first pair of the same length as the cephalothorax; first two pairs of spines of the anterior tibiae very long and overlapping as usual; lateral scopulae of anterior tarsi very thin.

Epigynum without distinctly defined lateral ridges in the median region; sides strongly angulate in front of middle; guide usually pointed just in front of posterior foveae, between the anterior portions of which it is not concavely depressed as it is in *flavipes*, descending from the higher transverse ridge in a more nearly straight line than in the latter species. (Pl. XIII, fig. 1.)

Total length, 5 mm. Length of cephalothorax, 2.4 mm.; width, 1.8 mm.

Length of leg I, 7.3 mm.; tib. + pat., 2.4 mm.; met., 1.5 mm.

Length of leg II, 7 mm.

Length of leg III, 7 mm.

Length of leg IV, 10.5 mm.; tib. + pat., 3 mm.; met., 3.5 mm.

Male.—Darker than female and the light and dark markings more strongly contrasting; entire eye region black; supramarginal light stripes of cephalothorax often obscure; femora of first legs entirely black, those of second pair pale over most of ventral surface, the black of dorsal surface more or less interrupted with yellow; posterior femora with dark rings which are more broken or interrupted than in female; distal joints of all legs yellow, without any dark annuli. *Palpi* entirely black except the patellae and the tips of the tarsi which are yellow or, in life, bright white.

Tibia of *palpus* a little longer than the patella, becoming thicker distally, tarsus as long as the two preceding joints together. *Scopus* resembling that of *milvina*, but reaching to or beyond the exterior side of the alveolus; lower border of the inferior furrow of anterior lobe developed at the exterior side into a dorsally concave, boat-shaped structure which at the exterior end is keeled and bears below a short rounded flap, the upper margin of the furrow with a strongly chitinized triangular process or tenaculum directed caudally toward the process of the inferior margin as in *milvina*. (Pl. XIII, fig. 2.)

Total length, 4.6 mm. Length of cephalothorax, 2.3 mm.; width, 1.9 mm.

Length of leg I, 7.1 mm.; tib. + pat., 2.5 mm.; met., 1.8 mm.

Length of leg II, 6.6 mm.

Length of leg III, 6.5 mm.

Length of leg IV, 10.3 mm.; tib. + pat., 3.1 mm.; met., 3.2 mm.

Syn.—1876. *Lycosa minima*, Keyserling, Verh. z. b. Ges. Wien, 26, p. 614.

1885. *Pardosa albopatella* Emerton, Trans. Conn. Oc. Sci., 6, p. 497, Pl. 94, figs. 2 to 2b.

1890. *Lycosa minima*, Marx, Proc. U. S. N. M., 12, p. 562.

— *Pardosa albopatella*, Marx, *ibid.*, p. 565.

1890. *Pardosa albopatella*, Stone, Proc. Acad. Nat. Sci. Phila., 42, p. 431.

1891. *Pardosa minima*, Banks, Ent. News, 2.

1892. *Pardosa albopatella*, Marx, Proc. Ent. Soc. W., 2, p. 161.

1892. *Pardosa albopatella*, Banks, Proc. U. S. N. M., 44, p. 70.

— *Pardosa annulata*, Banks, *ibid.*, p. 68, Pl. 1, fig. 41.

1895. *Pardosa minima*, Banks, J. N. Y. Ent. Soc., 3, p. 91.

1900. *Pardosa minima*, Banks, Proc. Acad. Nat. Sci. Phila., p. 539.

1902. *Pardosa albopatella*, Emerton, Common Sp. of U. S., p. 83, figs. 205–207.

1902. *Pardosa minima*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 571, Pl. 30, figs. 35, 36.

Type locality.—Alabama.

Known localities.—Illinois!, Massachusetts, Connecticut, Rhode Island!, New Hampshire!, District of Columbia!, Pennsylvania, New Jersey!, Alabama, Kansas!, Indiana.

While the males are easily distinguishable, the females of this species and of *milvina* are much alike both in general appearance and in the structure of the epigyna. Aside from the differences in the epigyna, which are difficult to state, the cephalothorax of *saxatilis* is relatively higher in front and slopes more decidedly caudally and the face protrudes above more strongly. There are constant differences in the proportions of the legs. The markings of *saxatilis* are finer.

Pardosa milvina (Hentz), 1844.

(Sub *Lycosa*, J. Bost. S. N. H., Vol. IV, p. 392, Pl. XVIII, fig. 8.)

Sides of cephalothorax deep brown to black; eye region deep black, a yellow to brown median band beginning as a rather narrow process at or behind third eye row, expanding a little posteriorly on each side and then again constricted in front of middle, expanding about dorsal groove and then narrowing again down posterior declivity; on each side a submarginal light band which in some is obscure anteriorly, but is usually distinct to clypeus in front; clypeus yellow or brown with a triangular black spot below each anterior lateral eye; sides of cephalothorax with brown pubescence, the light stripes with yellow,

the clypeus with yellow and some white. *Chelicerae* yellow to brown each with a short black median mark at base, clothed with whitish pubescence and sparse long brown bristles. *Endites*, *labium* and *coxae* of legs yellow to brown.

Sternum usually black, often with a lighter median line in front, clothed with yellow or yellowish-white pubescence; sometimes lighter, dark brown or even yellow with or without dark spots. *Legs* yellow with dark rings on all joints except the tarsi, clothed with whitish and some short darker pubescence. *Abdomen* above at base with a yellow to reddish-brown stripe ending in front of middle; opposite apex of basal mark an angular pale spot with dark dot in center, and behind a series of transverse rows of similar spots more or less confluent transversely as usual; often a yellow line close to and parallel with the margin of the basal mark on each side; dorsum laterally black with numerous small yellow dots; dorsum clothed with brown and white pubescence, the white in part in angular spots at sides and in transverse lines between the pale marks of tegument; sides yellow with many spots and mottlings of brown or above of black, in life covered with pubescence in intermixed spots and streaks of white and brown; venter pale, rarely dark, densely clothed with light gray pubescence.

Spinnerets yellow or light brown.

Epigynum brown, darker, reddish at margins.

Face relatively high, nearly of same height as length of *chelicerae*; sides nearly straight, subvertical. *Cephalothorax* high, the posterior declivity very steep, in profile nearly level from third eye row to posterior declivity, slightly depressed at median furrow, sides steep.

Anterior row of *eyes* much shorter than the second, only slightly procurved; anterior median eyes nearly three-fourths their diameter apart, evidently closer to the lateral eyes; anterior lateral eyes visibly smaller than the median, of usual distance from eyes of second row and from the front margin of clypeus; eyes of second row not quite once and a half their diameter apart. Quadrangle of posterior eyes more than one-fourth the length of the cephalothorax.

Labium a little wider than long (6.25 : 6); basal excavation more than one-fourth the total length of labium; sides substraight, strongly converging anteriorly; front margin slightly convex.

Legs slender; metatarsus of fourth pair of same length as tibiae and patella together; spines of anterior tibiae as usual; anterior tarsi with but very sparse scopulae at sides, posterior tarsi setose and spinulose as usual.

Epigynum with more or less evident lateral ridges, margins usually not angulate in front of middle; septal piece of guide not pointed at front of foveæ, more depressed between foveæ than in *saxatilis*. See Pl. XIII, fig. 3.

Total length, 6 mm. Length of cephalothorax, 2.4 mm.; width, 2 mm.

Length of leg I, 9 mm.; tib. + pat., 2.3 mm.; met., 1.7 mm.

Length of leg II, 6.9 mm.

Length of leg III, 6.8 mm.

Length of leg IV, 10.3; tib. + pat., 3 mm.; met., 3 mm.

Male.—Darker in color than female, the *cephalothorax* often nearly entirely black, especially anteriorly, with the side stripes obscured and the median light mark not extending forward beyond front end of dorsal furrow. *Abdomen* often entirely black above, with light markings absent or but faintly indicated. Tarsus of *palpus* always black, the other joints often so, and always darkened by black pubescence.

Tibiæ of the *palpus* longer than the patella and distinctly broader, broadest anteriorly. Scopus long, bent outward above but not reaching margin of alveolus; basal spur short, bent down at apex, not covered; margin of inferior furrow of anterior lobe with a single short and stout tenaculum. (Pl. XIII, fig. 4.)

Total length, 5.2 mm. Length of cephalothorax, 2.8 mm.; width, 2.1 mm.

Length of leg I, 9.9 mm.; tib. + pat., 3.2 mm.; met., 2.4 mm.

Length of leg II, 9.4 mm.

Length of leg III, 8.9 mm.

Length of leg IV, 12.9 mm.; tib. + pat., 3.8 mm.; met., 4.2 mm.

Syn.—1871. *Lycosa canadensis*, Blackwall, Ann. Nat. Hist., Vol. VIII, pp. 430, 431.

1876. *Lycosa flavipes* Keyserling, Verh. z. b. Ges. Wien, 26, p. 616, Pl. 7, fig. 4.

1885. *Pardosa nigropalpis* Emerton, Trans. Conn. Acad., 6, p. 497, Pl. 48, fig. 3 to 3b.

1890. *Pardosa nigropalpis*, Marx, Proc. U. S. N. M., 12.

— *Pardosa nigropalpis*, Stone, Proc. Acad. Nat. Sci. Phila., 42, p. 430.

1892. *Pardosa nigropalpis*, Banks, Trans. Acad. Nat. Sci. Phila., 44, p. 70.

— *Pardosa pallida*, Banks (ad. part. in Coll. in Univ. Cornell), *ibid.*, p. 68.

— *Pardosa nigropalpis*, Marx, Proc. Ent. Soc. W., p. 161.

1893. *Pardosa flavipes*, Banks, J. N. Y. Ent. Soc., 1, p. 125.

1894. *Pardosa flavipes*, Banks, op. cit., 3, p. 91.

1900. *Pardosa milvina*, Banks (ad. part. max), Proc. Acad. Nat. Sci. Phila., p. 539.

1902. *Pardosa nigropalpis*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 569, Pl. 30, figs. 32-34.

— *Pardosa scita* Montgomery, *ibid.*, p. 573, Pl. 30, figs. 37, 38.

— *Pardosa nigropalpis* Emerton Common Sp. of U. S., p. 83, figs. 205-207.

Type locality—Alabama.

Known localities.—Maryland!, Illinois!, Massachusetts, Connecticut, Rhode Island!, New York!, District of Columbia!, Pennsylvania, Virginia, North Carolina!, Georgia!, Alabama!, Louisiana!, Mississippi!, Kansas!, Indiana!.

One of the commonest and most widely distributed of North American *Pardosas*. Specimens from the South are lighter than those from the North, the sternum being frequently yellow or white without marks, and at other times being covered in varying degrees with black dots, the dots in some covering entire sternum, except for the anterior median light stripe, and in others found only in a single row along each margin. In the same locality all gradations may be found between dark, typically colored individuals and the pale forms.

***Pardosa pauxilla* Mtg.**

Female.—Sides of *cephalothorax* blackish brown or deep chocolate color; a rather wide yellow or pale brown band along each lateral margin extending forward to the clypeus which is of the same light color; eye region black; back of eyes a median dagger-shaped light brown stripe of usual character. *Chelicerae* yellow. *Labium*, *endites* and *coxae* of legs beneath yellow or yellowish brown. *Sternum* yellowish brown, blackish toward margins and with scattered black spots over the middle portion. *Legs* also yellow or yellowish brown with numerous dark annuli which are deep and distinct on the femora and tibiae, but are less strong or sometimes indistinct on the metatarsi; of these annuli there are four on each femur and tibia and three on each metatarsis; each patella has a median annulus with indications in some of darkened ends. *Abdomen* with dorsum black to deep brown minutely dotted with yellow; at base a yellow lanceolate stripe with an angular spot each side of apex as usual, followed behind by a series of wide chevron-marks of the ordinary character; because of the extent of the yellow markings in some the dorsum appears to be occupied over its middle region from base to spinnerets by a yellowish band which narrows caudally and encloses rather indistinct dark markings; sides of abdomen dark like the lateral portions of dorsum, but the yellow dots larger, becoming more and more extended and confluent ventrally, finally passing into the immaculate yellow or yellowish white venter. *Spinnerets* pale brown. *Epigynum* reddish brown.

Anterior row of *eyes* of the usual relative length and curvature; anterior median eyes fully their diameter apart, much closer to the smaller lateral eyes, their diameter or a little more from the eyes of

second row; anterior lateral eyes twice their diameter or a little more from the front margin of clypeus, their diameter from eyes of second row; eyes of second row one and one-fourth times their diameter apart; quadrangle of posterior eyes longer behind than in front in ratio of 9 : 7, considerably more than one-fourth as long as the cephalothorax (1 : 3.5).

Spines of tibiae of *legs* and clothing of tarsi as usual.

Epigynum in shape roughly like a very wide-necked decanter, though more angular in outline; posterior foveæ not sharply limited, the lateral furrows gradually narrowing cephalad to a mere line at the anterior end, the sides bulging in correspondingly on each side; guide somewhat anchor-shaped with the transverse pieces relatively short and stout, the median piece with lateral plates along entire length, these continuously narrowing cephalad until the septum at its anterior end is very narrow. (Pl. XIII, fig. 9.)

Total length, 5 mm. Length of cephalothorax, 2.5 mm.; width, 1.8 mm.

Length of leg I, 7.2 mm.; tib. + pat., 2.6 mm.; met., 1.5 mm.

Length of leg II, 7 mm.

Length of leg III, 6.9 mm.

Length of leg IV, 10.6 mm.; tib. + pat., 3.2 mm.; met., 3.3 mm.

Male.—Considerably smaller than female. *Legs* yellow, entirely without rings or markings excepting the femora of the first two pairs which are black on the basal half, the black more or less interrupted by yellow laterally and below. *Palpi* entirely black, clothed with dense black hair. Median stripe of *cephalothorax* obscure. *Abdomen* entirely black without light markings in the tegument, but in life with a row of white spots formed of bunches of hair on each side behind, with narrow transverse lines of white hair extending between the spots; venter yellow with a dark median mark more or less dilated in front of the spinnerets; clothed with white hair. *Chelicerae* black except along disto-mesal side, clothed with deep brown pubescence except distally where it is gray and longer.

Bulb of *palpal* organ very convex, protruding conspicuously from alveolus; *scopus* similar in form to that of *milvina*, but the basal spur cylindrical and relatively longer than in that species; there are considerable differences in the conductors of these two species.

Total length, 4.1 mm. Length of cephalothorax, 2.1 mm.; width, 1.3 mm.

Length of leg I, 5.2 mm.

Length of leg II, 5 mm.

Length of leg III, 5 mm.

Length of leg IV, 7.7 mm.; tib. + pat., 2.3 mm.; met., 2.6 mm.

Locality.—Austin, Texas!

Pardosa banksi Chamberlin, 1904.

(Canadian Entomologist, Vol. XXXVI, p. 175.)

Female.—Eye region and sides of *cephalothorax* black or brownish black; on each side a distinct supramarginal yellow band which reaches to the clypeus in front; a less clearly marked median dagger-shaped band of brown along dorsum from posterior margin to the third eye row, this band but little wider than the lateral bands except at its expanded anterior end, where, however, its lateral portions are obscure; clypeus yellow, marked below each anterior lateral eye with a triangular black spot, the apex of which is at the eye, and the base upon the front margin of clypeus. *Chelicerae* smoky yellow, with a dark line running down near the inner side and bending obliquely outward across the front face distally, there becoming indistinct; a black line along each margin of the lateral condyle. *Sternum* light brown with a black median lanceolate stripe which is divided anteriorly by a short yellow line. *Legs* clear yellow or pale brown of a greenish hue, or with faint traces of rings on the posterior ones, otherwise entirely without markings. *Abdomen* above black with a reddish yellow lanceolate stripe at base, with a similarly colored quadrate spot with black dot at center each side of apex, and a series of transverse yellow marks behind formed of similar spots united in pairs; an indistinct light mark joining the basal lanceolate stripe on each side near its base and another one joining it near the middle on each side, these marks formed of rows of small dots; sides of abdomen black like the dorsum except for a yellow spot or stripe in front below each antero-lateral angle; venter yellow with a brown spot enclosing spinnerets and a median dark line extending from this spot forward to the epigynum. Anterior *spinnerets* brown, the posterior ones more yellow. *Epigynum* light reddish brown.

Face as high as the length of the *chelicerae* or very nearly so; sides straight and subvertical. *Cephalothorax* highest a little behind third eye row, from where in profile the dorsal line is straight to the posterior declivity.

Anterior row of *eyes* shorter than the second, of the usual relative length, gently procurved; anterior median eyes fully three-fourths their diameter apart, closer to the lateral eyes, a little more than their diameter from eyes of second row; anterior lateral eyes about three-

fourths as large in diameter as the median, twice their diameter from front margin of clypeus, once and a third their diameter from eyes of second row; eyes of second row their diameter apart; quadrangle of posterior eyes a little wider in front than long, fully one-fourth the length of the cephalothorax.

Lower margin of furrow of *chelicerae* with three teeth, of which the third is but little shorter than the first two; upper margin with *three* teeth of the relative proportions more common in the genus *Lycosa*.

Tibia + patella of fourth *legs* of same length as the metatarsus; tibia + patella of the first pair of legs shorter than the cephalothorax; spines of the anterior tibiae of usual arrangement and proportions; all tarsi setose and spinulose, the anterior ones but thinly scopulate laterally.

Transverse piece of guide of *epigynum* of moderate length; septal piece evident forward to the anterior end of the epigynum, with well-developed lateral plates along its entire length, these being behind as wide as the transverse piece of guide and gradually and continuously narrowing anteriorly. (Pl. XIII, fig. 7.)

Total length, 5.5 mm. Length of cephalothorax, 2.7 mm.; width, 2.1 mm.

Length of leg I, 7 mm.; tib. + pat., 2.4 mm.; met., 1.5 mm.

Length of leg II, 6.8 mm.

Length of leg III, 6.7 mm.

Length of leg IV, 9.6 mm.; tib. + pat., 3 mm.; met., 3 mm.

Male.—"The male palpus from the side shows three black, rounded projections, the lower one the smallest." (Banks.)

Length, 5 mm.

Syn.—1896. *Pardosa littoralis* Banks, J. N. Y. Ent. Soc., 4, p. 192. (Nom. preocc.)

Type locality.—Long Island, N. Y. (Mill Neck).

Habitat.—Long Island (Mill Neck!, Sheepshead Bay!), Florida!.

Found in salt marshes. The type specimens were found in the marshes near Mill Neck in June. The description above is based on two females from Sheepshead Bay, taken in August, 1903, (C. R. Crosby).

***Pardosa moesta* Banks, 1892.**

(Proc. Acad. Nat. Sci. Phila., 44, p. 70, Pl. 3, fig. 44.)

Female.—*Cephalothorax* dark reddish brown with radiating lines of black, a pale median band which becomes darker and more obscure anteriorly; entire eye region black; in some scarcely paler above lateral

margins, in others (southern specimens) with a marginal pale stripe more or less evident on each side. *Clypeus* reddish yellow, the yellow area higher on each side. *Chelicerae* reddish yellow; a blackish line bordering the condyle on each side, the two lines uniting at its lower end and extending down the front of the chelicerae. *Endites* yellow. *Labium* dark brown, paler distally. *Coxae* of legs beneath yellow. *Sternum* black. *Legs* reddish yellow; the femora marked with dark rings which are mostly incomplete below, above often more or less diffused, the annuli thus often more or less confluent dorso-laterally, especially on the front femora; patellae and tibiae also marked with incomplete dark rings, the first tibiae darker than others, almost wholly black. *Abdomen* above black, densely minutely punctate with reddish yellow; dorsum with a faint basal spear-shaped stripe of a dusky reddish yellow color; sides of abdomen like the dorsum, but the light dots larger and more elongate; venter light reddish brown; a narrow, irregularly edged stripe or line of black on each side, the two converging caudad, and a similar stripe along median line behind the epigynum, this stripe running to a point posteriorly. *Epigynum* brown of a light reddish tinge.

Face with its sides straight and nearly vertical, the chelicerae in length about one and one-fourth times longer than its height; face protruding above the eyes of the second row being borne at the ends of a bulging transverse ridge. *Cephalothorax* highest at the third eye row, in profile the dorsal line slopes gradually to the posterior declivity, but is gently concave at the dorsal groove.

First row of *eyes* much shorter than the second, not fully extending from center to center of eyes of second row, procurved in usual degree; anterior median eyes fully three-fourths their diameter apart, half as far from the lateral eyes, a little more than their diameter from eyes of second row; anterior lateral eyes three-fourths or more as large as the median eyes, twice their diameter from front margin of clypeus, one and one-third times their diameter from eyes of second row; eyes of second row their diameter apart; quadrangle of posterior eyes as wide in front as long, half as wide again behind as in front or nearly so, the cephalothorax only 3.5 times as long.

Lower margin of the furrow of the *chelicerae* with three teeth, of which the first two are stout and subequal but the third much reduced; the upper margin of the furrow with two teeth of the usual proportions.

Legs with the metatarsus of the fourth pair longer than the tibia + patella; tibia + patella of the first pair of the same length as the cephalothorax; spines of anterior tibiae of common form, the two first

pairs very long and overlapping; tarsi with scopulæ on sides of anterior ones, the posterior simply setose and spinulose. *Labium* longer, wider than long, strongly attenuated anteriorly, the front margin subtruncate.

Epigynum with transverse piece of guide rather wide, the guide plates along its front side with the free margin wavy; the posterior foveæ wide and conspicuous; septal piece of guide low and narrow for most of length, extending to the anterior depression where it expands fan shape. (Pl. XIV, fig. 9.)

Total length, 5.7 mm. Length of the cephalothorax, 3 mm.; width, 2.2 mm.

Length of leg I, 8.8 mm.; tib. + pat., 3 mm.; met., 2.2 mm.

Length of leg II, 8 mm.

Length of leg III, 8 mm.

Length of leg IV, 13.1 mm.; tib. + pat., 4 mm.; met., 4.2 mm.

Male.—Unknown.

Type locality.—New York (Ithaca).

Known localities.—New York (Ithaca!, Lake Keuka!), District of Columbia!

Specimens I have seen from Washington, D. C., are paler throughout than indicated in the description above, which is based on individuals from Ithaca and Penn Yan, N. Y., including one of the types. The species is in some respects much like *saxatilis*.

Pardosa sternalis (Thorell), 1877.

(Sub *Lycosa*, Bull. U. S. Geol. Surv. Terr., 3, p. 504.)

Female.—Sides of the *cephalothorax* and the dorsal eye area black; a median band of brown color of reddish caste beginning back of eyes and passing posteriorly over dorsal groove and narrowing down the posterior declivity to a line; the median band at its anterior end is nearly always bifurcate, the two slender divergent processes embracing between them a similarly colored spot, with which they are connected each by a narrow line; a light brown band along each lateral border, limited below posteriorly by a black marginal line and geminated for its entire length by a second black line; the lateral bands are continuous and attain the clypeus in front which is of the same color; median light stripe with some white pubescence, but with brown hair predominating for most of its length; sides with brown pubescence; marginal light stripes clothed above and below the geminating dark line with white pubescence, the dark lines with sparser brown hair. *Chelicerae* reddish yellow or light brown, normally with a blackish line along the

antero-mesal line of each chelicera, this line distally turning obliquely outward and reaching the outer side; clothed mostly with white hair except distally where brown hair and bristles are intermixed. *Labium* and *endites* light brown, paler at tips. *Coxæ* of legs beneath light brown. *Sternum* with ground color brown, mostly with a row of black spots along each lateral margin, and occupied over the middle region by a large black area divided by a median light line; sometimes the black area is much reduced and the yellow or brown color then predominates, but usually the black covers all but a rather narrow stripe toward each side and the mesal light line; subdensely clothed with long white or light gray hairs. *Legs* light brown, all joints except tarsi marked with black annuli which are close together on the proximal joints, which in consequence often appear very dark; the metatarsus has three well-separated dark annuli and appears paler like the tarsi; black rings of femora more or less broken ventrally. *Abdomen* above blackish; a very distinct yellow or pale brown lanceolate median stripe at base, with an obliquely placed yellow angular spot of usual type each side of apex, and behind a series of four or five similar and obliquely placed pairs of spots, the pairs more or less confluent mesally, into anteriorly pointed chevron-shaped cross-bands; a yellow mark each side of base of the median lanceolate stripe; dorsum for the most part covered with brown pubescence, but each side of lanceolate mark a row of spots formed by bunches of white hair, and behind but more widely separated two similar rows of lateral white spots with sometimes a median row of similarly formed white marks; sides below yellow or pale brown clothed with brown pubescence intermixed in spots and streaks with white, which becomes more abundant below and entirely clothes the venter; tegument of venter yellowish, sometimes with four rows of small brown dots which converge posteriorly. *Spinnerets* brown. *Epigynum* light reddish brown, darker marginally.

Sides of *face* steep, but little rounded and slanting outward below; moderate in height, the chelicerae once and a half as long as its height or nearly so. Dorsal line of *cephalothorax* nearly straight and level to the posterior declivity.

Anterior row of *eyes* considerably shorter than the second, reaching but little beyond centers of eyes of the latter, slightly procurved; anterior median eyes fully their diameter apart, half so far from the but slightly smaller lateral eyes, their diameter or slightly less from eyes of second row; anterior lateral eyes not fully twice their diameter from front margin of clypeus, rather more than their diameter from eyes of second row; eyes of second row their diameter apart; quadrangle of posterior eyes one-fourth the length of the cephalothorax.

Upper margin of furrow of *chelicerae* with three teeth as in *Lycosa*; lower margin with three teeth, of which the median one is stoutest and some longest, the first well separated from it but the third contiguous with it at base, the latter tooth reduced but not so much as in most *Pardosas*. *Labium* clearly wider than long (6.5 : 6); basal excavation one-fourth the total length; strongly attenuated anteriorly, the sides straight or toward the middle weakly concave, anterior margin truncated or very slightly convex.

Legs with tibia + patella of fourth pair of same length as the metatarsus; tibia + patella of the first legs of same length or a little shorter than the cephalothorax; tarsi clothed as usual; spines of anterior tibiae as usual. (Pl. VIII, figs. 7 and 9.)

Epigynum pentagonal in form, its anterior portion triangular; posterior foveae relatively small, abruptly depressed, each roughly pentagonal in shape with the longest side along the septal piece of guide; lateral ridges behind narrow, converging but rather widely separated behind, not bent abruptly inward toward each other as in *atra*. (Pl. XIII, fig. 5.)

Total length, 7 mm. Length of cephalothorax, 3 mm.; width, 2.3 mm.

Length of leg I, 8.1 mm.; tib. + pat., 2.8 mm.; met., 1.9 mm.

Length of leg II, 8.1 mm.

Length of leg III, 9 mm.

Length of leg IV, 12.1 mm.; tib. + pat., 3.7 mm.; met., 3.7 mm.

Male.—*Cephalothorax* darker than in the female, the median band obscure and usually not at all evident except caudally and about the dorsal furrow; lateral pale bands narrower and more obscure and the marginal dark line or stripe wider. *Chelicerae* black or brownish black except distally and along the mesal surface. *Sternum* entirely black. *Abdomen* above entirely black, showing no markings; venter dusky brown to gray black; pubescence, as also of cephalothorax, as in female. *Legs* with femora above black or nearly so except distal, also usually paler beneath; more distal joints of two anterior pairs of legs pale, with faint annuli or entirely unmarked, the corresponding joints on the posterior legs darker but also with markings faint. *Palpi* entirely black except the patellae which are light brown.

Tibia of *palpus* a little longer than the patella and stouter distally. *Scopus* very long, curving obliquely forward and outward quite across the bulb. (Pl. XIII, fig. 6.)

Total length, 5.5 mm. Length of cephalothorax, 3 mm.; width, 2.1 mm.

Length of leg I, 8.7 mm.; tib. + pat., 3 mm.; met., 2.2 mm.

Length of leg II, 8.3 mm.

Length of leg III, 8.3 mm.

Length of leg IV, 11.4 mm.; tib. + pat., 3.5 mm.; met., 3.5 mm.

Syn.—1890. *Lycosa sternalis*, Marx, Proc. U. S. N. M., 12, p. 563.

1894. *Pardosa sternalis*, Banks, J. N. Y. Ent. Soc., 2, p. 51.

1894. *Pardosa coloradensis* Banks (at least ad. part. magn.), J. N. Y. Ent. Soc., 2, p. 51.

1895. *Pardosa coloradensis* Banks, Ann. N. Y. Acad. Sci., 8, p. 429 (Jrs.).

1895. *Pardosa luteola*, Banks, but not Emerton, *loc. cit.*

1904. *Pardosa sternalis*, Chamberlin, Can. Ent., pp. 147 and 175.

Type locality.—Colorado.

Known localities.—Colorado!, Utah!, Idaho!, Kansas!, Iowa!.

A strongly marked species very common in the West.

Specimens of *coloradensis* Bks. in Mr. Banks' collection, which he kindly permitted me to study, are the not fully mature individuals of the species above described.

Pardosa atra Banks, 1894.

(J. N. Y. Ent. Soc., Vol. 2, p. 52.)

Female.—*Cephalothorax* brownish black, lighter brown along the middle, and with a few indistinct paler marks at borders especially behind; not rarely a pale transverse stripe entirely across the posterior margin; eye region deep black; median light band constricted in front of dorsal groove, becoming anteriorly very dark or obscure. *Cephalothorax* with median band and side marks in life clothed with whitish or light gray pubescence, the hair elsewhere dark brown; the entire eye region with numerous long dark bristles which project forward. *Chelicerae* blackish, reddish brown distally. *Labium* and *endites* deep brown to blackish. *Sternum* black. *Coxae* of legs beneath brown suffused with blackish. *Legs* blackish, paler distally; the femora with a few mottlings of reddish brown, the other joints indistinctly or obscurely annulate with the same color; legs densely pubescent and with numerous long erect black bristles. *Dorsum of abdomen* black; a paler reddish-brown spear-shaped mark at base; the basal stripe contiguous at its apex with a large pale spot on each side, these spots with the characteristic black dot at center; posteriorly two rows of similar spots which are confluent at the mesal line in pairs, thus forming a series of wide chevron-formed marks; dorsum at sides with rather large reddish brown dots or spots, the entire dorsum often appearing reddish brown covered over with an irregular network of black; sides similar to lateral portions of dorsum but light color more abundant venter of abdomen brown except along sides where are some irregular black marks. *Epigynum* and *spinnerets* fuscous.

Face of average height and shape.

First row of *eyes* but slightly procurved, much shorter than the second; anterior median eyes about their diameter apart, only half so far from the lateral eyes, of usual distance from eyes of second row; anterior lateral eyes situated as usual; eyes of the second row more than their diameter apart, half as far again from the eyes of the much wider third row; quadrangle of posterior eyes not entirely one-fourth as long as the cephalothorax.

Labium much wider than long (8.25 : 6.5); basal excavation very short, scarcely more than one-sixth the length of the labium; labium anteriorly strongly attenuated, sides rounded just above basal notch, but above nearly straight for most of length; antero-lateral angles widely rounded; front margin gently widely incurved. (Pl. VIII, fig. 3.)

Legs with the tibia + patella of the fourth pair of the same length as the metatarsus; tibia + patella of the first pair clearly shorter than the length of the cephalothorax; spines of anterior tibiæ of usual form and arrangement; tarsi of anterior pairs with thin scopulæ at sides.

Epigynum a strongly chitinized suboval area which is truncate behind; the posterior foveæ relatively small, circular, deep and abruptly delimited; lateral ridges bent inward toward each other behind, the space between their ends occupied by the posterior end of the short clavate guide which separates the foveæ; the anterior and greater area of the epigynum scarcely depressed each side of the median line. (Pl. XIII, fig. 8.)

Total length, 9 mm. Length of the cephalothorax, 3.8 mm.; width, 2.9 mm.

Length of leg I, 9.8 mm., tib. + pat., 3.3 mm.; met., 2 mm.

Length of leg II, 9.7 mm.

Length of leg III, 9.6 mm.

Length of leg IV, 13.4 mm.; tib. + pat., 4 mm.; met., 4 mm.

Type locality.—Colorado.

Known localities.—Colorado!, Utah!.

In some respects this species is like *grænlandica*. The cephalothorax is smaller with the head narrower and more elevated. It is also darker and its markings are less distinct. The epigynum seems constant in its form and is easily distinguished from that of *grænlandica*. The median piece of guide at times is similarly somewhat elevated anteriorly.

Pardosa emertoni Chamberlin, 1904.

(Can. Entomologist, Vol. XXXVI, p. 175.)

Cephalothorax with a deep brown longitudinal band enclosing the eyes of each side and extending to the posterior end of cephalothorax, the two leaving between them and also along each border a yellow band, the two dark bands and the three yellow bands being of approximately the same width; each marginal band is bisected posteriorly by a dark supramarginal line; the median band often of a reddish tinge; the lateral dark bands united in front across the face, enclosing the eyes of the first and second rows, the median pale band narrowing and ending in a point between the second and third eye rows; marginal bands continuous in front with the yellow clypeus; in life the yellow bands covered with white pubescence, which extends also from median band forward between eyes to clypeus; sides of cephalothorax covered with brown pubescence. *Chelicerae* yellow, with sparse white hair and long dark brown bristles. *Labium* brown. *Endites* and *coxae* of legs beneath yellow. *Sternum* yellow, with four rows of black spots which converge posteriorly, the two inner rows uniting posteriorly into a single line; clothed with white hair. *Legs* yellow to brown; the femora above dark, blackish, or with blackish streaks, but pale beneath; tibiae and tarsi of posterior pairs sometimes darkened; clothed with white pubescence and some sparser dark hairs. *Abdomen* with a black band across the anterior face which extends backward on each side across the antero-lateral angle as a narrow stripe which reaches to the spinnerets, the two black stripes leaving a wide reddish yellow median band which is widest in front; in the basal portion of the dorsal yellow band are two black lines or rows of black dots which meet in a point at the middle forming thus a spear-shaped outline; behind the dorsal band is more or less indistinctly divided by narrow transverse lines into segments which contain each two minute black dots; sides of abdomen pale yellow with numerous small black spots which are more scattered ventrally and which are absent from a spot beneath each antero-lateral angle; venter pale or whitish yellow with two rows of black spots converging from the genital furrow to the spinnerets; abdomen with the dark bands and spots clothed with brown hair, elsewhere densely clothed with white hair which gives its color to the abdomen in life or when dry. *Spinnerets* yellow. *Epigynum* yellow, darker marginally.

Cephalothorax highest between eyes of second and third rows, concave between eyes of third row and the posterior declivity. Face high, as high as the length of the chelicerae which are small and narrowed distally.

First row of *eyes* much shorter than the second, hardly or not quite extending from center to center of the eyes of the latter row, a little procurved; anterior median eyes three-fourths their diameter apart, somewhat closer to the smaller lateral eyes; anterior lateral eyes twice their diameter from front margin of clypeus, once and a half their diameter from eyes of second row; anterior median eyes more than their diameter from eyes of second row; eyes of second row some less than once and a half their diameter apart; quadrangle of posterior eyes rather more than one-fourth the length of the cephalothorax.

Labium evidently wider than long (5.75 : 5); basal excavation about one-fifth the total length of labium; labium in front of excavations broadly cordate, the sides converging to a rounded point in front (Pl. VIII, fig. 6), in middle region substraight but above convexly curving to the middle point.

Legs slender, metatarsus longer than tibia + patella of the fourth pair; the two latter joints together clearly longer than the cephalothorax; tibia + patella of first legs of nearly same length as the cephalothorax; spines and scopulæ of usual character.

Septal piece of the guide of the *epigynum* in front rather narrow with sides subparallel, but posteriorly abruptly and widely expanded into a circular lobe which covers over most of the caudal portion of the epigynum. (Pl. XIV, fig. 1.)

Total length, 6.3 mm. Length of cephalothorax, 2.9 mm.; width, 2.1 mm.

Length of leg I, 8.8 mm.; tib. + pat., 3 mm.; met., 2 mm.

Length of leg II, 8.6 mm.

Length of leg III, 8.2 mm.

Length of leg IV, 12.4 mm.; tib. + pat., 3.8 mm.; met., 4 mm.

Male.—Male palpi black distally; front legs and head darker than in the female, but otherwise there is not much difference between them.

The scopus of the palpal organ is very long and wide and curved obliquely outward across the bulb.

Syn.—1885. *Pardosa pallida* Emerton, Trans. Conn. Acad. Sci., 6, p. 496, Pl. 49, figs. 3 to 3c. (Nom. preocc. by *P. pallida* Walck., 1837.)

1890. *Pardosa pallida*, Marx, Proc. U. S. N. N., 12, p. 565.

1892. *Pardosa pallida*, Banks, Proc. Acad. Nat. Sci. Phila., 44, p. 68.

1903. *Pardosa pallida*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 653, Pl. 29, fig. 3.

Type locality.—New Hampshire.

Known localities.—New Hampshire!, Massachusetts, Connecticut, New York!, District of Columbia!, Ontario!, Manitoba!.

Pardosa distincta (Blackwall), 1846.

(Ann. and Mag. Nat. Hist., Vol. XVII, pp. 32, 33.)

Female 6 mm. long; light yellow with brown markings.

The *cephalothorax* has two wide brown longitudinal stripes united at the front of the head where they are nearly black, and a fine dark line each side next the legs. The sides of the *abdomen* are brown, with a very distinct light spot over the dorsal vessel, and a row of transverse light spots behind. The *sternum* is brown with a light spot in the middle. The abdomen is light beneath with a narrow brown stripe half its length on each side. The *epigynum* is bright orange brown, and the front pair of spinnerets are black. The *legs* are spotted with brown, the spots sometimes grouped in rings; the tibiae are the darkest parts of the legs.

The *epigynum* has the guide short and wide, but this part is transparent and the overlapping sides are not easily seen, so that it appears narrow. (Pl. XV, fig. 8.)

In the male the *cephalothorax* and *abdomen* are darker, and the *legs* lighter except at the base, where the upper sides of the coxæ and part of the femora are darker than in the female. The head and palpi are black, with the patella and tibia a little lighter on top and probably having some light hairs when alive.

The male palpi are large, the tarsus being about as long as tibia and patella. The palpal organ is dark colored and projects a little from the bowl of the tarsus. The basal hook is rounded in the middle and curves in a hook toward the base. (Pl. XV, fig. 9.)

This species is about the same size and color as *P. pallida* Emerton of New England. The sternum is dark with a light median stripe on its front half, while in *pallida* the sternum is light with four dark lines or rows of spots converging behind. In the males the palpi, mandibles and maxillæ are darker than in *pallida*. The epigynum resembles that of *pallida*, but is shorter and wider. The male palpi have the scopus short and turned down at the point, while in *pallida* it is long and slender, and extends across the whole width of palpus. (Emerton.)

Syn.—1894. *Pardosa luteola* Emerton, Trans. Conn. Acad., Vol. 9, p. 427, Pl. 3, fig. 7.

Locality.—Canada.

Pardosa californica Keyserling, 1887.

(Verh. z. b. Ges. Wien, 37, p. 483, Pl. 6, fig. 44.)

Female (type).—Sides of *cephalothorax* dark brown, the eye region black; a median light yellowish brown band of the usual dagger shape,

produced anteriorly as a tongue-like process between the eyes of the third row, this process divided by a median black line produced backward from in front; behind the third eye row the median band is abruptly extended laterally on each side, the widened region being nearly though not fully as wide as the third eye row, the band then again abruptly narrowed until but half so wide, continuing of this width about the dorsal furrow, then passing down the posterior declivity and narrowing to an acute point near the posterior margin; on each side a marginal light band which extends for the entire length and attains the clypeus in front, the band interrupted and sometimes obscured by brown spots; clypeus pale, but with a triangular black spot below each anterior lateral eye, the apex of the spot, as usual, being upward and contiguous with the black surrounding the eyes.

Chelicerae light reddish yellow; each at base with a black mark or line which passes obliquely outward and distally, and with a larger mark parallel with the first beginning at the inner side near the middle and running obliquely outward and distally. *Labium* and *endites* with yellow background, which in each case is nearly covered over by a central black area. *Sternum* yellow with a large black spot on each side extending from the middle to the front margin, leaving the median area yellow; behind with numerous minute dark dots. *Coxae* of legs beneath smoky yellow. *Legs* reddish yellow, all joints except the tarsi with rather heavy black rings, these rings being incomplete on the femora along the postero-inferior face except at the distal end. *Palpi* colored like legs, but annuli less heavy. *Abdomen* above and on the sides black with numerous minute reddish yellow dots; dorsum at base with a reddish-yellow spear-shaped stripe reaching caudad to the middle; near each lateral margin of the basal stripe toward the front is a row of two or three black spots, and each side of its apex is an obliquely placed angular light spot enclosing a central black spot; on the posterior portion of dorsum a series of several chevron-marks, each seemingly formed by the coalescence at the mesal line of two black centered, angular light spots such as found each side of apex of the basal mark; venter yellow, darker about the sides and caudad and with a median dark stripe as wide as epigynum in front, but narrowing to a truncate end behind and not reaching to the spinnerets. *Epigynum* light reddish brown.

Sides of *face* nearly straight, steep but not vertical, in height considerably shorter than the length of the *chelicerae*.

Anterior row of *eyes* much shorter than the second, not extending more than between the centers of eyes of the latter, gently procurved;

anterior median eyes more than three-fourths their diameter apart, about two-thirds as far from the scarcely smaller lateral eyes, fully their diameter from eyes of second row; anterior lateral eyes twice their diameter from front margin of clypeus, slightly more than their diameter from eyes of second row; eyes of second row their diameter apart; quadrangle of posterior eyes as wide in front as long, wider behind than in front in the ratio of 4 : 3, some more than one-fourth as long as the cephalothorax.

Chelicerae with furrows armed below as usual with three teeth, of which the middle is a little longest, the third not very much reduced; the upper margin with *three* teeth of which the first is minute.

Tibia + patella of fourth *legs* of same length as the metatarsus; tibia + patella of first pair of same length as the cephalothorax; legs of fourth pair four times as long as the cephalothorax; tarsi as usual in the genus, those of the first two pairs of legs being scopulate laterally, those of the posterior pairs simply setose; tibiae of first and second pairs of legs with three pairs of spines below as is normal, the two first pairs of these very long and overlapping; all tarsi straight or nearly so.

Epigynum presenting no distinct lateral ridges posteriorly; lateral plates of the guide very wide, extending laterally to or nearly to the ends of the transverse piece and nearly as wide in front as behind, covering over nearly completely the posterior half of the epigynal area. (Pl. XIV, fig. 5.)

Total length, 6.8 mm. Length of cephalothorax, 2.9 mm.; width, 2.1 mm.

Length of leg I, 8.4 mm.; tib. + pat., 2.9 mm.; met., 1.9 mm.

Length of leg II, 8 mm.

Length of leg III, 8 mm.

Length of leg IV, 12.1 mm.; tib. + pat., 3.6 mm.; met., 3.6 mm.

Male (type).—*Cephalothorax* in color drab brown, with the head region black; a narrow and short, inconspicuous median stripe over the dorsal groove but not distinguishable in front of it, narrowing behind as in female, not reaching posterior margin; marginal pale bands nearly as in the female but obscured anteriorly. *Clypeus* not pale, black like head region. *Labium* and *endites* blackish, pale distally. *Sternum* nearly as in female. *Palpi* entirely black. *Legs* yellow, the femora with inconspicuous black marks above, other joints with dark circular lines about bases of the spines but otherwise unmarked. *Abdomen* much as in female but with the markings much obscured.

Scopus of palpal organ short and blunt, much as in *lapidicina*; anterior margin of conductor much thickened, presenting three fleshy lobes with apices projecting backward over the furrow.

Syn.—1890. *Pardosa californica*, Marx, Proc. U. S. N. M., 12.
1904. *Pardosa californica*, Chamberlin, Canadian Ent., p. 146.

Type locality.—California.

Known localities.—California!, Utah!.

This is a common *Pardosa* on the Pacific Coast. Specimens from Utah are lighter colored than those which I have seen from California (including Keyserling's types, described above, which have of course darkened in the alcohol). In the Utah specimens the lateral yellow stripes are wide, with the upper margin sinuous and with a black line along the lower, a somewhat indistinct and irregular black line dividing the stripes longitudinally; endites yellow; labium and sternum brown, the latter usually not showing the black markings as described above for the type; chevron-marks of dorsum containing each from two to four black dots, as if formed by the confluence of as many light, black-centered dots; sides gray black with numerous minute brown dots; venter immaculate light gray or with a few small dark dots back of epigynum and at each side; spinnerets pale yellow. *Cephalothorax* in life clothed with light gray and brown hair, the sides with brown, the median band especially posteriorly with gray, and the lateral stripes with gray except along the geminating dark line, the median stripe in front with brown and gray pubescence intermixed. *Chelicerae* with light gray hair and long brown bristles. *Sternum* and *legs* with light gray hair, the latter with longer brown bristles. *Abdomen* clothed above with chiefly light brown hair, light gray or white hair in spots on each side and forming some transverse lines posteriorly, scattered longer dark brown bristles; sides of abdomen with brown and gray pubescence intermixed in streaks and spots; venter with hair unmixed gray.

Pardosa lapidicina Emerton, 1885.

(Trans. Conn. Acad., 6, p. 494, Pl. 48, figs. 5 to 5c.)

Female.—Sides of the *cephalothorax* black; a lighter, though sometimes indistinct or even obscure median band of dark reddish brown color which begins as a narrow process between the posterior eyes, behind the third eye row abruptly widens and is constricted in front of dorsal furrow, at the caudal end of which it is strongly narrowed, its margin more or less dentate; on each side, at least posteriorly, a row of supramarginal light spots which are sometimes obscured, but in others are long and distinct; eyes surrounded with black; *labium* black, not paler than sides of cephalothorax; sides of cephalothorax clothed densely with rather long gray or brownish gray to blackish pubescence,

which quite conceals the light markings of the tegument and gives the cephalothorax a uniform grayish black appearance. *Chelicerae* reddish brown to reddish yellow, usually with a black median mark at base, clothed densely with white pubescence, with sparse longer dark brown bristles. *Endites* yellow or light brown, paler apically, often dusky. *Labium* deeper colored than endites, dark brown to black. *Sternum* black, clothed subdensely with short whitish or light gray pubescence. Legs yellow to brown; on all joints except the tarsi with black annuli which are broadest proximally, being on the femora often confluent below and laterally, leaving light spots only above; the *legs* have usually a bluish or greenish-gray hue proximally, especially on ventral surface. *Abdomen* with tegument above and over sides bluish black, a black-margined lanceolate mark at base above, followed on each side behind by a row of irregular pale spots; the median region behind, in some with, but in others without, irregular light chevron-marks, enclosing the characteristic dark spots, in some pale specimens entire dorsum and sides with many light spots, irregularly connected above into a network; venter light brown, of bluish to greenish gray cast, rarely black, in some a dark median band behind spinnerets; dorsum and sides covered with brown and grayish pubescence, the venter with grayish.

Face moderately high, the sides substraight and very steep, nearly vertical.

First row of *eyes* much shorter than the second, but little procurved; anterior median eyes fully three-fourths their diameter apart, evidently closer to the lateral eyes, than which they are slightly larger; anterior lateral eyes, as usual, twice their diameter from front margin of clypeus, their diameter from eyes of second row; eyes of second row about once and a quarter their diameter apart; quadrangle of posterior eyes one-fourth as long as the cephalothorax, a little wider in front than long. *Chelicerae* armed as typical for the genus, having two teeth above and three below with the third reduced. *Labium* wider than long in ratio of about 9 : 8.25; basal excavation one-fourth total length, strongly attenuated anteriorly; the front margin nearly straight, slightly incurved mesally.

Legs long and slender; metatarsus of fourth pair longer than tibia + patella of same pair; spines below on anterior tibiae as usual; scopulae of typical form.

Epigynum with the guide inversely T-shaped, the median piece pointed anteriorly and not extending into front portion of depression, which is thus undivided; transverse arms widest distally; lateral plates of guide very narrow. (Pl. XIV, fig. 7.)

Total length, 9.3 mm. Length of cephalothorax, 3.7 mm.; width, 3 mm.

Length of leg I, 13.1 mm.; tib. + pat., 4.8 mm.; met., 3.5 mm.

Length of leg II, 12.5 mm.

Length of leg III, 12.8 mm.

Length of leg IV, 7.3 mm.; tib. + pat., 5.3 mm.; met., 5.5 mm.

Male.—Color much as in female but darker and the markings more obscure; the legs often almost entirely black, showing no annulations except distally or none at all. Tarsus of palpus black, as also the femur and often the tibia, the patella lighter. Smaller than female.

Tibia of *palpus* with sides substraight, enlarging from base to apex, clearly narrower than the tarsus. Scopus very short, about as broad as long, distally rounded and a little uncate at exterior side; spur usually in front concealed by fold; embolus short, extending but little beyond middle; conductor divided into two open furrows by a narrow chitinous ridge extending obliquely downward and outward, the posterior margin of the exterior furrow with two short, uncate tenacula close together or in part overlapping. (Pl. XIV, fig. 8.)

Total length, 6 mm. Length of cephalothorax, 3 mm.; width, 2.3 mm.

Length of leg I, 10.1 mm.; tib. + pat., 3.3 mm.; met., 2.9 mm.

Length of leg II, 10.2 mm.

Length of leg III, 10.4 mm.

Length of leg IV, 13.6 mm.; tib. + pat., 4.3 mm.; met., 4.4 mm.

Syn.—1892. *Pardosa lapidicina*, Marx, Proc. Ent. Soc. W., 2, p. 161.

——. *Pardosa lapidicina*, Banks, Proc. Acad. Nat. Sci. Phila., p. 68.

——. *Pardosa obsoleta* Banks, *ibid.*, p. 71, Pl. 3, fig. 45.

——. *Pardosa venusta* Banks, *ibid.*, p. 69, Pl. 1, figs. 42, 42a.

1894. *Pardosa lapidicina* Emerton, Trans. Conn. Acad. Sci., 9, p. 428.

1902. *Pardosa lapidicina* Emerton, Common Sp. U. S., p. 78, figs. 186, 187, 188.

1903. *Pardosa lapidicina*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 652, Pl. 29, figs. 6, 9.

1904. *Pardosa mercurialis* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 270, Pl. XIX, figs. 20, 21.

——. *Pardosa texana* Banks, J. N. Y. Ent. Soc., p. 115, Pl. V, fig. 4.

Type locality.—Massachusetts and Connecticut.

Habitat.—Massachusetts, Connecticut, Rhode Island!, Canada, New York!, New Jersey!, District of Columbia!, Pennsylvania, Indiana!, Iowa!, Kansas!, Arkansas!, Texas!.

A very familiar species in the Northern States, found among stones along streams and also to some extent remote from water in dry places. Its general dark gray color blends well with the color of the stones among which it lives. Specimens from the West and South are commonly much lighter than specimens from the Northeast, and in them the marginal

spots on the cephalothorax form a band except for narrow dark cross-lines; the legs are more conspicuously annulate, the light rings contrasting more strongly with the dark. As other species having the same range as *lapidicina* undergo similar changes in brightness of color, and especially since the light form of *lapidicina* and all intermediate forms are not rare in the North, the Western specimens of this *Pardosa* ought not to be granted rank as separate species or variety. Type specimens of *venusta* Bks. that I have seen are not fully adult, and agree perfectly with immature specimens of *lapidicina*.

Pardosa xerampelina (Keyserling), 1876.

(Sub *Lycosa*, Verh. z. b. Ges. Wien, 26, p. 622, Pl. 7, fig. 8.)

Female.—Sides of *cephalothorax* and eye region black or deep brown; clypeus light brown; no distinct lateral light stripes, but sometimes a few obscure light spots above margin on each side posteriorly; a median reddish brown band which is widest about the dorsal groove, behind which it is strongly and more or less abruptly narrowed, the light median band mostly dull and inconspicuous; in life the cephalothorax is clothed along sides and on head and over median band behind by whitish pubescence, the other parts clothed with brown and black hair. *Chelicerae* reddish brown, each with a short longitudinal yellowish stripe above or at middle. *Labium* and *endites* brown, paler at tip. *Sternum* dark reddish brown to blackish brown, an obscure median pale line anteriorly; clothed with light gray pubescence. *Coxae* of legs beneath brown. *Legs* yellow to brown; all joints excepting the tarsi ringed with black; the femora dorsally are distinctly darker than the other joints; clothed with brown and light gray pubescence, the gray over the light parts, the brown over the darker. *Abdomen* above black or nearly so; a lanceolate basal mark of brown; basal stripe joined at two points on each side near its apex by the ends of a V-shaped mark the apex of which is directed laterally; posteriorly a series of light transverse more or less chevron-shaped markings; all markings of dorsum more or less faint; sides of abdomen and part of the venter about the spinnerets black, the venter elsewhere being light brown; abdomen clothed above with brown pubescence with a row of small spots of whitish hair along each side; venter of abdomen clothed with light gray pubescence. *Spinnerets* brown. *Epigynum* brown, with the depression showing as a distinctly darker V-shaped figure with apex caudal.

Face high, the *chelicerae* but little longer than its height; sides of face substraight, steep but a little slanting outward from above downward.

Dorsal line of cephalothorax in profile straight in front of the dorsal furrow, at which it is but slightly depressed.

Anterior row of *eyes* shorter than the second in the usual degree, only slightly procurved; anterior median eyes four-fifths their diameter apart, much closer to the but slightly smaller lateral eyes, their diameter from eyes of second row; anterior lateral eyes fully twice their diameter from front margin of clypeus, once and a half their diameter from eyes of second row; quadrangle of posterior eyes one-fourth as long as the cephalothorax.

Margins of furrow of *chelicerae* armed as usual. *Labium* wider than long, strongly attenuated, anteriorly truncated or a little concave.

Legs with tibia + patella of the fourth pair shorter than the metatarsus; tibia + patella of the first pair shorter than the cephalothorax; spines of anterior tibiae as usual, the first two pairs long and overlapping; tarsi clothed in the common manner.

Epigynum clearly wider in front than posteriorly; guide widest anteriorly narrowing caudally, the transverse arms of guide short, the guide plates extending to their ends; lateral ridges but weakly elevated. (Pl. XIV, fig. 3.)

Total length, 8 mm. Length of cephalothorax, 3.7 mm.; width, 2.6 mm.

Length of leg I, 10.2 mm.; tib. + pat., 3.3 mm.; met., 2.3 mm.

Length of leg II, 9.5 mm.

Length of leg III, 9.3 mm.

Length of leg IV, 14 mm.; tib. + pat., 4 mm.; met., 4.3 mm.

Male.—Smaller than the female but differing but little in coloration. "The male palpi are long and the joints scarcely enlarged." (Pl. XIV, fig. 4.)

Small specimens are 5 mm. long.

Syn.—1877. *Lycosa impavida* Thorell, Bull. U. S. Geol. Sur. Terr., Vol. 3, p. 513.

1878. *Lycosa tachypoda* Thorell, Am. Nat., June, 1878.

1885. *Pardosa montana* Emerton, Trans. Conn. Acad. Sci., 6, p. 498, Pl. 49, figs. 5, 5a.

1890. *Lycosa xerampelina*, Marx, Proc. U. S. N. M., 12.

— *Lycosa impavida*, Marx, *ibid.*.

— *Lycosa tachypoda*, Marx, *ibid.*.

— *Pardosa montana*, Marx, *ibid.*.

1892. ? *Pardosa montana*, Banks, Proc. Acad. Nat. Sci. Phila., 44, p. 70.

1894. *Pardosa tachypoda*, Emerton, Trans. Conn. Acad. Sci., 9, p. 427, Pl. 3, figs. 6, 6a.

1895. *Pardosa impavida*, Banks, Ann. N. Y. Acad. Sci., Vol. 8, p. 430.

1902. *Pardosa tachypoda* and *montana*, Emerton, Common Sp. of U. S., p. 81, figs. 193 to 196.

1902. *Pirata procursus* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 583, Pl. 30, fig. 48.

Type locality.—Illinois.

Known localities.—New Hampshire!, Massachusetts, Illinois, Colorado!, Utah!, New York?, Pennsylvania, Canada.

Essentially a Northern and mountain species. It is not uncommon in Canada and in the White Mountains of New England, but does not occur commonly more southward. It also ranges south from Canada along the Rocky Mountains, and is common in Colorado and Utah.

Pardosa gröenlandica (Thorell), 1872.

(Sub *Lycosa*, Ofvers. af. Vet. Akad. Forh., 29.)

Female.—*Cephalothorax* black or nearly so; a lighter, brown median band beginning only a little in front of dorsal furrow, passing over the latter and then narrowing to a line on the posterior declivity; from the front of the median band a horn-shaped yellow mark extends outward and forward on each side toward the corresponding eye of the third row, which, however, it does not reach; more rarely these horn-like marks are obscure or quite absent; a row of three or less commonly four curved light marks above the margin of each side; hair of cephalothorax long, brown and light gray or whitish intermixed, the whitish hair more or less unmixed with brown on the clypeus, the light supramarginal marks and on the median light area behind. *Chelicerae* reddish-yellow or brown above and black distally, the lighter color often reduced to a few spots; clothed with short light gray hair and longer brown bristles. *Labium* and *endites* brown, lighter at tips. *Sternum* black, clothed with gray hair. *Coxae* of legs beneath brown. *Legs* brown, mostly of a reddish hue; all joints, excepting tarsi, with distinct black annulations; clothed with brown and whitish hair, chiefly over the dark and light parts respectively. *Palpi* brown; femora ringed with black; patellæ unmarked; tibiæ black at proximal end and the tarsi black at tips. *Abdomen* above black or blackish brown, the tegument either entirely without light markings or with a lanceolate basal mark of reddish-brown color; each side of this mark at its base may be a spot of the same color, as also an obscure smaller spot each side of apex behind; more rarely there may be distinguishable posteriorly a number of obscure light spots more or less confluent in pairs; abdomen covered above with brown hair, with bunches of white hair forming a row of white spots along each side; sides of abdomen above like the dorsum, below light brown with numerous darker, reddish-brown or rust-colored spots usually connected into a continuous network; sides covered with brown and white hair intermixed in streaks and spots and quite concealing the tegument and its

markings; venter brown, with in most a median and on each side a lateral stripe of reddish-brown or rust color behind genital furrow, these stripes formed by a close network; venter clothed with white hair. *Spinnerets* brown, the anterior ones frequently darker or even blackish. *Epigynum* reddish brown.

Chelicerae rather long for a *Pardosa*, once and a fourth or more times as long as the height of the *face*; sides of face nearly straight, steep.

Anterior row of *eyes* much shorter than the second, slightly procurved; anterior median eyes their diameter apart or nearly so, rather less than half as far from the lateral eyes, their diameter from eyes of second row; anterior lateral eyes but slightly smaller than the median, twice their diameter from front margin of clypeus and their diameter from eyes of second row; eyes of second row a little more than their diameter apart; quadrangle of posterior eyes one-fourth the length of the cephalothorax.

Chelicerae with the lower margin armed with three teeth of usual proportions, the upper with two. *Labium* as wide as long or slightly wider (8 : 7.8); basal excavation about one-fourth or slightly more the length of the labium; strongly attenuated anteriorly; the sides rounded below but straight or substraight above; front margin straight or very slightly incurved.

Legs with the metatarsus of the fourth pair longer than the tibia + patella; tibia + patella of the first pair of the same length as the cephalothorax; spines of tibiae as usual; tarsi clothed as common in the genus.

Epigynum somewhat flask- or decanter-shaped, being narrow in front but widely rounded behind; lateral furrows narrow and shallow in front, widely expanded behind; septum high, narrow in front and more or less clavately widening caudally, higher than the transverse arms, which are dark in color, more or less rounded above and bent backward distally, their ends fitting into excavations in the lateral ridges. (Pl. XIV, fig. 6.)

Total length, 10.5 mm. Length of cephalothorax, 4.2 mm.; width, 3.7 mm.

Length of leg I, 13 mm.; tib. + pat., 4.2 mm.; met., 3 mm.

Length of leg II, 12.5 mm.

Length of leg III, 12.8 mm.

Length of leg IV, 17.6 mm.; tib. + pat., 5.4 mm.; met., 5.8 mm.

Male.—Color in general as in the female though rather darker; *palpi* entirely black and black-haired or with the patella paler above; *legs* darker than in female, the light markings being more reduced. The

cephalothorax is a little longer than the tibia + patella of the first legs. *Legs* a little longer relatively than in the female.

Palpi thick and short; patella as long as the tibia which is gradually dilated distally; tarsus as long as the two preceding joints taken together. The scopus is short and blunt, its basal spur straight.

Total length, 9.5 mm. Length of cephalothorax, 4.5 mm.; width, 3.5 mm.

Length of leg I, 13 mm.

Length of leg II, 13 mm.

Length of III, 13.5 mm.

Length of leg IV, 17.75 mm.; tib. + pat., 5 mm.

Syn.—1877. *Lycosa tristis* Thorell, Bull. U. S. G. Surv. Terr., Vol. 3, No. 2, p. 510.

——. *Lycosa indigatrix* Thorell, *ibid.*, p. 512.

——. *Lycosa iracunda* Thorell, *ibid.*, p. 514.

——. *Lycosa sinistra* Thorell, *ibid.*, p. 517.

1878. *Lycosa dromæa* Thorell, Am. Nat., June.

1885. *Pardosa albomaculata* Emerton, Trans. Conn. Acad. Sci., 6, p. 495, Pl. 48, figs. 3 to 3b.

1890. *Lycosa grænlandica*, *tristis*, *indigatrix*, *iracunda*, *sinistra*, Marx, Proc. U. S. N. M., 12, pp. 562, 563.

——. *Pardosa albomaculata*, Marx, *ibid.*, p. 565.

1894. *Pardosa grænlandica*, Emerton, Trans. Conn. Acad. Sci., 9, p. 423, Pl. 4, figs. 1 to 1f.

——. *Pardosa indigatrix* and *iracunda*, Banks, J. N. Y. Ent. Soc., 2, pp. 51 and 52.

1895. *Pardosa grænlandica* and *tristis*, Banks, Ann. N. Y. Acad. Sci., 8, p. 430.

1902. *Pardosa albomaculata* or *grænlandica*, Emerton, Common Sp. of U. S., p. 79, figs. 189, 190.

Type locality.—Greenland.

Known localities.—Greenland, Canada!, New England (White Mountains)!, Colorado!, Utah!

“Bare rocks on the upper part of the White Mountains, running very rapidly and dodging under stones at slight alarm” (Emerton).

A boreal species. Common in the mountains of Utah and Colorado.

Pardosa modica (Blackwall), 1846.

(Ann. and Mag. Nat. Hist., Vol. XVII, p. 33.)

Female.—*Cephalothorax* deep brown or black marked by two lateral and a median longitudinal pale stripe; eye region deep black; median stripe reddish brown, widest just behind third eye row, narrowed and constricted at the front end of the dorsal groove and again immediately behind it, geminated in front of the groove by a median black line; lateral pale stripes supramarginal, narrow, reaching to the clypeus in front which is likewise pale; pale stripes clothed with white hair, the

dark parts with brown. *Chelicerae* yellowish to brown over front face, darker at tips and along a narrow stripe extending down the mesal face and turning obliquely outward below; also a dark line along exterior face. *Labium* and *endites* brown, usually darker toward base. *Coxae* of legs beneath brown. *Sternum* brown, with a black stripe or row of black spots each side of the median line and a narrower black line or row of small spots along each lateral margin; sometimes entirely black; clothed with grayish white hair. *Legs* brown; femora marked above and beneath with several longitudinal black lines or narrow stripes and with cross-marks on the sides; tibiae above with a transverse black band at the proximal end, and with a median longitudinal black line extending from this to the distal end, and also with a similar black line along each lateral face; the basal black band on posterior tibiae usually half as wide as the length of the joint, narrow on anterior ones; at least the posterior patellae with a median longitudinal black line above and a similar one at each side; metatarsi especially of the posterior pairs with a more indistinct median dorsal line, the posterior ones also usually annulate with dark; the femora appear evidently darker than the more distal joints and the posterior legs darker than the anterior. *Abdomen* above brownish black; a basal lanceolate stripe of reddish-brown color; a series of transverse lines behind of same color, usually more indistinct, these marks formed of two rows of converging spots as is usual; sides of abdomen reddish brown mostly spotted with black; venter light brown, often with two dark lines close together along the median line and gradually converging caudad; sometimes a similar dark line at each side; at other times the venter is brown without markings or with dark spots at the sides; in life the abdomen is clothed above over the dark parts with dark brown hair, the light lanceolate basal mark covered with whitish hair, and a number of transverse lines of similar light hair behind with or without a row of small white spots along each side of them. *Epigynum* dark brown. *Spinnerets* dark brown to black.

Cephalothorax of moderate height or rather low; in profile highest at the third eye row, the dorsal line from there to the posterior declivity nearly straight, gradually slanting, depressed each side of the dorsal groove. *Chelicerae* about once and a fourth as long as the *face* is high; sides of face nearly straight, slightly slanting from the vertical.

Anterior row of *eyes* of the usual relative length and curvature; anterior median eyes their diameter apart or nearly so, much closer to the lateral eyes; anterior lateral eyes smaller than the median, a little more than their diameter from eyes of second row, twice their

diameter from front margin of clypeus; eyes of second row their diameter apart; quadrangle of posterior eyes one-fourth the length of the cephalothorax, as wide in front as long.

Teeth of the margins of the furrow of the *chelicerae* of the typical arrangement and form. *Labium* of the same width as length or nearly so; labium about four and a half times longer than its basal excavation; attenuated as usual; sides above straight; front margin straight.

Legs with the tibia + patella of the fourth pair a little longer than the metatarsus or sometimes of the same length; tibia + patella of the first legs evidently shorter than the cephalothorax; spines of tibiae and clothing of tarsi as usual.

The *epigynum* in its general form resembles that of *grænländica*; the septal piece of guide is more abruptly depressed anteriorly, usually widened into a quadrangular form at front of the wide foveæ and then clavately widening caudally; transverse arms of guide more conspicuous, strongly bent forward at their ends; posterior ends of lateral ridges more widely separated. (Pl. XV, figs. 1 and 3.)

Total length, 9 mm. Length of cephalothorax, 4 mm.; width, 3 mm.

Length of leg I, 9.5 mm.; tib. + pat., 3.3 mm.; met., 1.7 mm.

Length of leg II, 9.2 mm.

Length of leg III, 9.2 mm.

Length of leg IV, 13.7 mm.; tib. + pat., 4.2 mm.; met., 4 mm.

Male.—*Coloration* similar to that in female but darker; the median band of cephalothorax obscured in front of the dorsal groove; lateral light stripes narrow and indistinct or obscured; light markings of the abdomen indistinct.

Tibia of *palpus* of about the same length as the patella but evidently stouter, enlarged distad; sides of patella, seen from above, parallel; tarsus very broad, one and three-fourth times as broad as the tibia, ovate, acutely pointed. Palpal organ very similar to that of *grænländica*, but the embolus is relatively longer and there are differences in the conductor, etc. (Pl. XV, figs. 2 and 4.)

Total length, 8 mm. Length of cephalothorax, 4 mm.; width, 3.2 mm.

Length of leg I, 10.4 mm.; tib. + pat., 3.6 mm.; met., 2.1 mm.

Length of leg II, 10.5 mm.

Length of leg III, 10.1 mm.

Length of leg IV, 12 mm.; tib. + pat., 4.2 mm.; met., 4.3 mm.

Syn.—. *Lycosa glacialis* Thorell. Ofvers. af. Vet. Akad. Forh., 29.
1875. ? *Lycosa furcifera* Thorell Proc. Bost. Soc. N. Hist., 17, p. 499.

- . *Lycosa fuscula* Thorell, *ibid.*, p. 501.
 1877. *Lycosa concinna* Thorell, Bull. U. S. G. Surv. Terr., 3, p. 506
 1878. *Lycosa glacialis* Thorell, Am. Nat., June.
 1885. *Pardosa brunnea* Emerton, Trans. Conn. Acad. Sci., 6, p. 495, Pl. 48, figs. 4 to 4b (variety).
 1890. *Lycosa glacialis, concinna, fuscula* and *furcifera*, Marx, Proc. U. S. N. M., 12.
 — . *Pardosa brunnea*, Marx, *ibid.*, p. 565.
 1892. *Pardosa brunnea*, Banks, Proc. Acad. Nat. Sci. Phila., 44, p. 70.
 1894. *Pardosa glacialis*, Emerton, Trans. Conn. Acad. Sci., 9, p. 424, Pl. 4, figs. 2 to 2i.
 — . *Pardosa brunnea* Emerton, *ibid.*, p. 425, Pl. 4, figs. 2g, 2h.
 — . *Pardosa concinna*, Banks, J. N. Y. Ent. Soc., 2, p. 51.
 1895. *Pardosa concinna*, Banks, Ann. N. Y. Acad. Sci., 8, p. 429.
 1896. ? *Pardosa brunnea*, Banks, J. N. Y. Ent. Soc., 4, p. 192.
 1902. *Pardosa glacialis*, or *brunnea*, Emerton, Common Sp. U. S.

Type locality.—Canada.

Known localities.—Greenland!, Canada!, Colorado, Utah!, Idaho, Oregon, Massachusetts, Connecticut, New Hampshire!.

Var. brunnea.—Emerton now believes his *brunnea* to be a synonym of *modica* (*glacialis*). All the specimens I have had the opportunity of examining from New England, however, present small differences both in epigynum and in the male palpus from specimens of *modica* from Greenland and Canada. But the species is subject to much variation; and it is uncertain whether the New England forms can be maintained more than tentatively as a distinct variety. (Pl. XV, figs. 3 and 4.)

This species is abundant in Greenland, Canada, Colorado and Utah.

Pardosa labradorensis (Thorell), 1875.

(Sub *Lycosa*, Proc. Bost. Soc. Nat. Hist., 17, p. 502.)

Female.—*Cephalothorax* brownish black with three rather narrow longitudinal bands covered with whitish hair, the middle one reaching to the pars cephalica, truncated and geminated anteriorly, narrowing backwards, the lateral bands supramarginal, continuous, rather uneven in the upper margin. *Chelicerae* dull yellowish or ferruginous brown. *Labium* blackish, with pale apex. *Endites* dark yellowish brown, their *palpi* of the same color, the femoral joint with blackish longitudinal streaks and spots. *Sternum* black. *Legs* of a dark and dull yellowish brown, the femora with dark streaks and spots above and on the sides, limiting above two large oblong pale spots divided longitudinally by a fine black line; the patellæ and tibiæ have each three blackish longitudinal lines. *Abdomen* brownish, with traces of a short white band at the anterior margin of the dorsum. *Epigynum* ferruginous. *Spinnerets* blackish.

Cephalothorax rather long and narrow, with the sides of the pars cephalica almost perpendicular.

The anterior row of *eyes* but very slightly, scarcely perceptibly, curved forwards, its central eyes of the same size as (at least not greater than) the laterals, and somewhat more distant from each other than from the lateral eyes; eyes of the second series separated by an interval not much (about one-fourth) greater than their diameter.

Chelicerae narrow, but slightly convex longitudinally; their length is greater than the height of the face and the length of the patellæ. *Labium* with slightly rounded apex.

Seen from the under side the anterior *tibiae* show four pairs of spines, the third pair belonging to the sides of the joint.

The *epigynum* forms no deep fovea, as in *P. fuscula*, *ex.gr.*, the elevated area shows, when the hair is rubbed off, a system of short furrows and impressions rather difficult to describe, and forming a large oblong figure, rather narrow in its anterior half, then dilated gradually with rounded sides, and truncated behind; the anterior part, which is divided from the posterior by a large but not deep transverse depression, shows two longitudinal parallel furrows, the anterior apices of which are rounded; the narrow interval between these furrows is pointed anteriorly, and has in the middle a very fine longitudinal furrow; the posterior broad part of the epigynum shows on each side a deep, oblique, incurved, crescent-formed fovea; the space between these foveæ is triangular, with the apex directed backward, and divided by a deep middle longitudinal furrow.

Total length, 6.5 mm. Length of cephalothorax, 3.25 mm.; width, 2.25 mm.

Length of leg I, 8.75 mm.

Length of leg II, 8 mm.

Length of leg IV, 13 mm.; tib. + pat., 3.75 mm.

Male.—A male thought to belong to this species differs by the *cephalothorax* being of a purer black, with the lateral bands less distinct. The *legs*, which have the same markings as in the female, are of a clearer yellowish-brown color than in that sex, but darker at the base; the *coxæ* are black above and blackish beneath, the thighs also blackish on the under side towards the base; the *tarsi* are yellowish brown scarcely black at the extreme apex (as in the female). The *palpi* are very dark yellowish brown (the tibial joint almost black) with black lines, and the tarsal joint quite black; the tibial joint is thickly clothed with black hair; also the other joints are black-haired. The *abdomen* has a very distinct narrow band at base covered with whitish hair; venter blackish.

The patella of the *palpus* is somewhat longer than broad, cylindrical;

tibia scarcely longer than the patella but broader, being slightly and gradually dilated toward the apex; the tarsus is as long as the two preceding joints together, almost pear-shaped. The genital bulb is very high at the base on the under side, this elevated part being obliquely truncated and emarginate on the outer side; it shows in front a large fovea, from which issues a very short and coarse obtuse tooth directed obliquely forward and outward, and bearing at its base a longer and narrower pointed black tooth directed outward and curved backward and downward; this latter tooth lies almost concealed in the fovea; in the middle of the outer margin of the bulb a strong, pointed, downwardly directed black tooth is visible; close to the anterior side of its posterior elevated portion is a transverse spine-like costa (embolus); the anterior lower part of the bulb shows on the outer side two pale appendages or narrow lobes.

Total length, 6.5 mm. Length of cephalothorax, 3.25 mm.; width, 2.25 mm.

Length of leg I, 8.75 mm.

Length of leg II, 8.5 mm.

Length of leg IV, 11.75 mm.; tib. + pat., 3.25 mm.

(From Thorell.)

Habitat.—Strawberry Harbor (♀) and Square Island (♂), Labrador.

The female was captured July 28; the male also in July. "This species greatly resembles *P. fuscula*; but it is smaller, with the sides of the head more perpendicular, the interval between the two largest eyes is smaller, and the form of the vulva is quite different. *P. labradorensis* is a *Pardosa* C. Koch, while *fuscula* (and *furcifera*) appear to belong to *Leimonium* C. Koch." (Thorell.)

In general coloration, proportions and structure, and especially in the structure of the ♂ palpus, this form is certainly very close to *modica*, and it may prove not to be anything different. It is possible that the differences in the epigynum, which Thorell thinks considerable, may be due to the type of *labradorensis* being not entirely adult, the epigynum of immature specimens of *modica* which I have seen seeming largely to agree with the description of that of *labradorensis* given as above by Thorell.

Pardosa mackenziana (Keyserling), 1876.

(Sub *Lycosa*, Verh. z. b. Ges. Wien, 26, p. 621, Pl. 7, fig. 7.)

Female.—*Cephalothorax* with a light median reddish-brown band as broad anteriorly as the eye area or nearly so, usually broken a little way back of its anterior end by a transverse dark stripe, behind

which the band continues of a uniform width over the median groove and then narrows down the posterior declivity, sometimes sending off a process from each side just in front of the posterior margin; sides of cephalothorax black, with or without an indistinct short light colored supramarginal stripe posteriorly, with sometimes one or two light spots anteriorly; this marginal band when present conspicuous; eye region entirely black; clypeus brown. *Chelicerae* bluish brown, a wide black stripe crossing the face of each obliquely from the inner face outward, leaving a paler tip and a paler portion above it. *Labium* and *endites* brown, with the tips paler. *Sternum* black, an obscurely lighter median line in front, such as occurs in *milvina*. *Coxae* of legs beneath light brown. *Legs* strongly marked with deep brown or black annulations alternating with rings of yellow or light brown, the latter rings much narrower on femora and tibiae, of the same width as the black ones on the metatarsus; the tarsi clear yellow or light brown or the anterior ones sometimes also obscurely annulate. *Abdomen* above black, with a lanceolate mark of red-brown at base and a series of transverse light marks behind, each of the latter being composed of mostly four confluent black-centred spots of same color; the transverse marks frequently obscure; sides of abdomen black, minutely spotted with brown, the spots large below; venter brown to gray. *Spinnerets* brown. *Epigynum* brown, of same hue as venter inconspicuous.

Face but little lower than the length of the *chelicerae*; sides straight and vertical or nearly so.

First row of *eyes* much shorter than the second, procurved; anterior median eyes their diameter or more apart, closer to lateral eyes which are of equal size; anterior lateral eyes twice their diameter from front margins of clypeus, their diameter or a little more from eyes of second row; anterior median eyes their diameter from eyes of second row; eyes of second row about their diameter apart; quadrangle of posterior eyes rather more than one-fourth the length of the cephalothorax.

Margins of furrow of *chelicerae* armed as usual. *Labium* of same width as length or very nearly so (1 : 1 to 7.25 : 7); basal excavation longer and shallower than usual, but less than one-third the length of labium; sides widely rounded below, straight above, front or anterior margin truncate or slightly indented at middle.

All tarsi spinulose beneath, the spinules arranged on all in two rows; the lateral scopulae of anterior pairs very sparse or scarcely evident.

Depressed area of epigynum anteriorly very narrow; the posterior area wide, almost completely filled by the expanded guide which

presents lateral plates along transverse arms in front and externally; the ends of arms extending into excavations in side walls. (Pl. XV, fig. 5.)

Total length, 6.5 mm. Length of cephalothorax, 3 mm.; width, 2 mm.

Length of leg I, 9.2 mm.; tib. + pat., 3.1 mm.; met., 2 mm.

Length of leg II, 8.7 mm.

Length of leg III, 8.6 mm.

Length of leg IV, 12.2 mm.; tib. + pat., 4 mm.; met., 3.7 mm.

Male.—Color of *cephalothorax* and abdomen as in female. Mandibles blackish with dusky brownish-yellow streaks. *Labium* and *endites* also blackish. The female joint of the palpi is brownish yellow with black spots and streaks especially toward the base; patella joint yellowish brown, the tibiae black on sides and pale brownish above, covered with black hair; tarsal joint black and black-haired, pale at apex. *Legs* brownish yellow, the thighs black beneath, except at apex, and with distinct blackish rings above; the following joints less distinctly ringed. (Thorell.)

The tibial joint is a little broader and, at least when seen from the side, slightly longer than the patellar joint, gradually but very slightly thickened toward the apex; the tarsal joint is fully as long as the two preceding joints together, about double as broad as the tibial joint, nearly ovate, but strongly narrowing toward apex, very convex. For structure of bulb see Pl. XV, figs. 6 and 7.

Total length, 6 mm. Length of cephalothorax, 3 mm.; width, 2.5 mm. (nearly).

Length of leg I, 10 mm.

Length of leg II, 9.5 mm.

Length of leg III, 9.5 mm.

Length of leg IV, 14 mm.; tib. + pat., 3.5 mm.

Syn.—1877. *Lycosa uncata* Thorell, Bull. U. S. G. S. of Terr., 3, p. 508.

1894. *Pardosa dorsalis* Banks, J. N. Y. Ent. Soc., 2, p. 51.

1894. *Pardosa uncata*, Emerton, Trans. Conn. Acad. Sci., 9, p. 425, Pl. 3, figs. 8 to 8f.

Type locality.—Mackenzie River.

Known localities.—Colorado!, Utah!, Idaho, Canada.

Pardosa longispinata Tullgren, 1901.

(Bih. till sv. Vet.-Akad. Handl., Band 27; Ofd. IV, No. 1, p. 23.)

Female.—Cephalothorax dark brown, clothed with short adpressed and long black upturned bristly hairs, with a white middle-band.

squarish in the cephalic part and as broad as the area of eyes, on the pars thoracica narrow; the eye area nearly black; at the margins broad white bands; the margin black. *Chelicerae* clothed with long bristly hairs. *Endites* and *labium* light yellow brown. *Sternum* light brown with long light hairs. *Legs* pale brown with dark rings. *Abdomen* brown, clothed with black and white short hairs without distinct markings; the venter light grayish.

Cephalothorax a little shorter than the length of tibia + patella of fourth legs and the breadth shorter than the length of tibia of the fourth pair of legs. Front row of eyes distinctly procurved, the central eyes largest and the interspace between the central eyes about equal to their diameter and longer than the space between the lateral eyes. The distance from the lateral eyes to the margin of the clypeus and to the eyes in the middle row about thrice their diameter. The eyes of the middle row very large and the interspace between them longer than their diameter. The interspace between the middle and the posterior eyes broader than the diameter of the middle eyes. *Chelicerae* a little longer than the face, very tapering at the apex and clothed with long bristly hairs, a little narrower than the femur of first pair. Tibia of first pair of legs below with 2, 2, 2 spines; these and other spines very long.

Total length, 4.2 mm. Length of cephalothorax, 2.5 mm.; width, 1.8 mm.

Length of leg I, 7.3 mm.

Length of leg IV, 10 mm.

(Description rearranged from the original.)

Locality.—Florida. One single adult female from Lake Leonore in Orange County.

This tiny *Pardosa* is not known to me at first hand. It is certainly a very unusual form, if it be true that the "distance from the lateral eyes to the margin of the clypeus and to the eyes in the middle row is about *thrice* their diameter," a statement much to be questioned.

Genus **SCHIZOCOSA** Chamberlin, 1904.

(Canadian Entomologist, Vol. XXXVI, p. 177.)

Entire body densely clothed with pubescence; the cephalothorax with a light median band as wide anteriorly as the eye area and either with or without submarginal pale bands. Spines of anterior tibiae in number and arrangement like those of *Pardosa* and *Lycosa*, in length varying between those of these two genera. Anterior row of eyes considerably shorter than the second, clearly procurved, more strongly

than usual in *Pardosa* or *Lycosa*; anterior median eyes larger than the lateral, of nearly same distance from each other as from the lateral eyes; clypeus narrow, the anterior lateral eyes at most their diameter or but little more from the front margin of clypeus, the same distance or considerably farther from the eyes of second row; eyes of second row large, less than their diameter apart; quadrangle of posterior eyes evidently wider behind than in front. Chelicerae as in *Lycosa*, the third tooth of the inferior margin of the furrow usually reduced. Labium distinctly longer than broad, the basal notch one-third its total length. Posterior spinnerets short, scarcely or not at all longer than the anterior. Epigynum with a distinct guide which is elevate and well developed anteriorly as in *Lycosa*; the transverse arms of guide double, being divided from their exterior ends mesally to a varying distance; lateral furrows not widening anteriorly. (See figs. of Pl. XVI.) Male palpus with a scopus exterior in position presenting two processes as in *Lycosa*; exposed area of lunate plate small; conductor conspicuously produced above, usually into a horn-like elevation of varying size; superior margin of inferior furrow presenting, more or less externally from its middle, a short and pointed, basally wide, plate-like tenaculum which is curved downward distally; a second, shorter tenaculum farther externally and anteriorly; auricula of lectus very long, extending forward along conductor and attaining or nearly attaining front margin of alveolus; embolus distinctly and more or less angularly elbowed at base of auricula. (See figs. of Pl. XVI.)

Syn.—1842. *Lycosa*, Hentz (ad. part. *ocreata* and *venustula*), J. Bost. S. N. H., IV, p. 228.

1875. *Lycosa*, Hentz (ad. part. cit.), Sp. of U. S., p. 24.

1876. *Lycosa*, Keyserling (ad. part. *ocreata* and *rufa*); Verh. z. G. Wien, p. 610.

1885. *Pardosa*, Emerton (ad. part. *bilineata*), Trans. Conn. Acad. Sci., VI, p. 494.

1892. *Pardosa*, Banks (ad. part. *gracilis*), Proc. Acad. Nat. Sci. Phila., p. 70.

1902. *Lycosa*, Montgomery (ad. part. *ocreata pulchra*, *relucens* and *verisimilis*), Proc. Acad. Nat. Sci. Phila., p. 536.

———. *Pardosa*, Montgomery (ad. part. *solivaga*), loc. cit.

1904. *Lycosa*, Montgomery (ad. part.), Proc. Acad. Nat. Sci. Phila., p. 276.

Pars cephalica truncated in front, its sides moderately rounded and sloping, the face rather high, its sides slanting in varying degrees, sometimes approaching the *Pardosa* type more and sometimes the *Lycosa*. The quadrangle of posterior eyes in length averaging one-fourth the length of the cephalothorax, being thus longer than in *Lycosa*. The legs are long and moderately stout, inclining to be slender distally; the anterior tarsi scopulate, at least laterally, the posterior tarsi setose

below; the tibia and patella of the fourth legs taken together are always considerably longer than the cephalothorax. The median light band of the cephalothorax widens uniformly from behind forward to the eyes; it is constricted in front of dorsal groove, but otherwise its margins are nearly straight. The *abdomen* in all is marked above by a broad light band which is nearly or fully as wide as the dorsum and which extends over its entire length from base to spinnerets; this band enclosing at base a lanceolate outline, and behind in some also a series of transverse angular lines of varying degrees of distinctness; sides of abdomen dark in color, black at least across anterior lateral angles; venter pale.

Spiders of medium or small size. The males are but little different in size from the females, but are sometimes characterized by having the tibiae of the front pair of legs darkened in color and densely clothed with long black hair which stands out in brush-like form.

The cocoon is spherical, without any seam at equator, and is white in color.

KEY TO SPECIES.

Females.

1. Sternum yellow, with two dark lines or rows of dark spots converging posteriorly, *bilineata* (Emerton).
Sternum dark, not marked as in *bilineata*, 2.
2. Septal piece of guide very broad immediately in front of transverse arms, narrowing anteriorly where it is not sinuous or bent; the median piece between anterior and posterior divisions of arms very narrow, much narrower than the septum in front of arms (Pl. XVI, fig. 1); sternum usually black except marginally, *ocreata* (Hentz).
Septal piece of guide sinuous or bent near anterior end; median piece between anterior and posterior divisions of arms wide, wider than septum in front of transverse arms (Pl. XVI, fig. 4); sternum usually reddish brown, *saltatrix* (Hentz).

Males.

1. First tibiae clothed with dense black hair standing out in brush-like form, 2.
First tibiae not so clothed, *saltatrix* (Hentz).
2. Legs yellow, without dark annuli or markings, *bilineata* (Emerton).
Legs annulate with dark, *ocreata* (Hentz).

Schizocosa ocreata (Hentz), 1844.

(Sub. *Lycosa*, J. Bost. Soc. Nat. Hist., IV, p. 391, Pl. XVIII, fig. 5.)

Female.—Sides of the *cephalothorax* brownish black; median band

reddish yellow, anteriorly passing forward broadly between eyes of third row and nearly reaching second, more or less divided at front end by a black median line or pointed process; eyes surrounded with black; on each side considerably above margin a narrow, wavy light line which does not extend forward upon the pars cephalica, this line often obscure; clypeus reddish yellow, crossed beneath each anterior lateral eye by a black mark or spot which is often confluent with its fellow across the middle, thus leaving the clypeus pale only laterally; light bands of cephalothorax in life clothed densely with white or light gray pubescence. *Chelicerae* reddish brown, often dusky, except at distal ends, and marked by black lines. *Endites* brown, the *labium* darker, usually blackish except at tip. *Sternum* usually black or nearly so, paler along borders, especially caudo-laterally; sometimes paler reddish brown. *Coxae* of legs beneath light brown. *Legs* reddish brown, paler distally, all joints except the tarsi with dark annulations, the annulations of the femora broader and deeper, commonly more or less confluent, especially the anterior pairs, the annulations of the other joints often indistinct. Sides of *abdomen* above dark, a black band passing from the front face backward across each antero-lateral angle and breaking up behind into numerous streaks and spots; the dorsum covered for entire length by a broad light brown band of often reddish tinge, the band usually constricted in front of middle; within the light band at base a lanceolate outline which bifurcates at its apex and is followed behind by a series of chevron-lines; lower part of sides of abdomen light brown, marked with small black spots; the venter light brown, either immaculate or with a median, and at each side a lateral, row of dark spots behind the furrow of the lung slits. *Epigynum* and *spinnerets* brown. Face moderately high, two-thirds as high as the length of the *chelicerae*, its sides moderately steep. First row of eyes considerably shorter than the second, distinctly procurved, the median three-fourths their diameter apart, nearly the same distance from the three-fourths as large lateral eyes; anterior lateral eyes their diameter, or slightly more, from front margin of clypeus, very little farther from eyes of second row, eyes of second row not fully their diameter apart; quadrangle of posterior eyes about one-fourth the length of the cephalothorax. *Chelicerae* armed as usual. *Labium* longer than wide, the basal notch very long, more than one-third the total length of labium; sides above straight and strongly converging, the front margin straight, not at all curved. *Legs* long, the distal joints rather slender; tibia + patella of first legs of same length as the cephalothorax; anterior tibiae armed beneath as usual, the first two pairs of spines long, nearly as in *Pardosa*, the first

overlapping the second; anterior tarsi with scopulæ at sides; a median ventral setose band, the posterior tarsi not at all scopulate being simply setose.

Septal part of guide of *epigynum* very broad, occupying much of epigynal depression, narrowest at anterior end; the transverse arms deeply divided, the median piece very narrow. (Pl. XVI, fig. 1.)

Total length of small female, 7.4 mm. Length of cephalothorax, 4.3 mm.; greatest width, 3.2 mm.

Length of leg I, 11.3 mm.; tib. + pat., 4.3 mm.; met., 2.1 mm.

Length of leg II, 10.7 mm.

Length of leg III, 10.3 mm.

Length of leg IV, 15 mm.; tib. + pat., 4.6 mm., met., 4.4 mm.

Male.—Coloration in general as in female. The tibiæ of first *legs* very densely clothed for entire length with long black hairs which stand out straight from joint; often of a greenish tinge. *Legs* longer than in female; tibia + patella of first legs longer than cephalothorax; spine of anterior tibia shorter than in female.

Tibia of *palpus* fully as wide as long, sides convex, widest at middle, much wider than the patella which is little shorter and widens from base distally, its sides straight; tarsus wider than the tibia, of same length as tibia and patella taken together. Lunate area very small, basal in position, its convexity external; horn of conductor very long, extending much beyond front margin of alveolus, bent at an angle below its middle; principal tenaculum situated at middle, unequally bidentate; lesser tenaculum bent upward at distal end, situated below antero-exterior angle; auricle gradually attenuated apically. (Pl. XVI, fig. 5.)

Length of large specimen, 8.6 mm. Length of cephalothorax, 4.6 mm.; width, 3.9 mm.

Length of leg I, 14.2 mm.; tib. + pat., 5 mm.; met., 3.3 mm.

Length of leg II, 13.3 mm.

Length of leg III, 13.1 mm.

Length of leg IV, 1.8 mm.; tib. + pat., 5.5 mm.; met., 5.3 mm.

Syn.—1875. *Lycosa ocreata* Hentz, Spid. of U. S., p. 33, Pl. 4, fig. 5.

1876. *Lycosa ocreata*, Keyserling, Verh. z. b. Ges. Wien, Vol. XXVI, p. 611, Tab. VII, fig. 5 (male).

——. *Lycosa rufa* Keyserling, *ibid.*, p. 613, Tab. VII, fig. 2 (female).

1885. *Lycosa ocreata*, Emerton, Trans. Conn. Acad. Sci., VI, p. 491, Pl. XLVIII, figs. 6, 6a, 6b.

1890. *Lycosa ocreata* Hentz, Marx, Proc. U. S. N. M., XII, p. 562.

——. *Lycosa rufa* Keyserling, Marx, *ibid.*, p. 563.

——. *Lycosa ocreata*, Stone, Proc. Acad. Nat. Sci. Phila., Vol. 42, p. 427.

1892. *Lycosa ocreata*, Banks, *op. cit.*, Vol. 44, p. 66.

——. *Lycosa ocreata*, Marx, Proc. Ent. Soc. W. II p. 160.

- . *Lycosa ocreata*, Fox, *ibid.*, p. 269.
 1893. *Lycosa ocreata*, Banks, J. N. Y. Ent. Soc., I, p. 125.
 1896. *Lycosa ocreata*, Banks, *op. cit.*, IV, p. 192.
 1898. *Lycosa ocreata*, Simon, Hist. Nat. Araign., II, p. 330.
 1900. *Lycosa ocreata*, Banks, Proc. Acad. Nat. Sci. Phila., p. 538.
 1902. *Lycosa ocreata*, Emerton, Common Sp. of U. S.
 ———. *Pardosa solivaga* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 574, Pl. XXX, fig. 39.
 ———. *Lycosa stonei* Montgomery, *ibid.*, p. 546, Pl. XXIX, figs. 9 and 10.
 1904. *Schizocosa ocreata*, Chamberlin, Can. Ent., XXXVI, p. 176.
 ———. *Lycosa ocreata*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 288.

Type locality.—North Carolina.

Known localities.—North Carolina!, Virginia, District of Columbia!, Alabama, Louisiana, Ohio, Illinois, Kansas!, Connecticut, New York!.

Hentz, in speaking of the occurrence of this species in North Carolina, says that it "is not rare in meadows near water." It is found in similar locations in New York State. Emerton states that in New Haven, Conn., it is "common in open woods among dead leaves. Adult about June 1."

Schizocosa saltatrix (Hentz), 1844.

(Sub *Lycosa*, J. Bost. Soc. Nat. Hist., IV, p. 387, Pl. XVII, fig. 7.)

Females.—Sides of *cephalothorax* deep brown, in life densely clothed with black intermixed with brown pubescence, a wide median band of usual form which is of reddish tinge anteriorly, extending forward between eyes of third row and there geminated by a fine dark line which extends back over pars cephalica towards dorsal groove; a supra-marginal light line on each side which sometimes attains and sometimes does not attain the clypeus in front, the border below these lateral stripes more or less broken by transverse light lines; median and lateral light stripes densely clothed with white intermixed with yellowish pubescence. *Chelicerae* dark brown clothed with short yellowish gray pubescence, which is not dense, and longer black bristles; the fringe of the superior margin of the furrow grayish. *Endites* yellowish brown, lighter at tips. *Labium* brown, darker than endites. *Sternum* beneath brown or reddish brown, the former often showing a lighter median line or stripe, clothed in life with gray or whitish intermixed with black pubescence. *Coxae* light brown to yellow, always paler than the sternum. *Legs* yellow to light reddish-brown, with numerous narrow though often indistinct dark rings (occasionally quite absent), which become fewer and often wider distally, the annuli of femora not so heavy and not confluent as in *ocreata*. Nearly entire dorsum of abdomen pale brown, often of a pale reddish in life, grayish from the pubescence which is light brown intermixed with spots of gray, line

at base a dark lanceolate outline, forked at apex and followed by a series of chevron-lines as in *ocreata*; these in life broadened behind by lines of white hair, a black spot over each anterior lateral angle extending a short distance condad, and usually a triangular black spot more or less constricting the median band towards the middle, the sides elsewhere with many dark spots, in life streaked and spotted with patches of white pubescence; venter pale brown to greenish yellow, in life densely clothed with white pubescence, the tegument often marked along each side with a row of small black dots curved convexly outward and converging posteriorly, a double median dark stripe sometimes present behind epigynum. Epigynum and spinnerets light brown.

Face moderate in height, less than two-thirds as high as the length of the chelicerae, the sides moderately rounded and standing outward below, more so than in *ocreata*.

Anterior row of *eyes* shorter than second by twice the diameter of a lateral eye, well procurved. Anterior lateral eyes their diameter from front margin of clypeus, slightly farther from eyes of second row less than their diameter apart; cephalothorax 4.5 times longer than quadrangle of posterior eyes.

Chelicerae armed as usual, the middle tooth of inferior margin longest, the third considerably reduced. *Labium* longer than broad (not quite 8.7) basal notch one-third the length of labium; sides of labium below but slightly convex, subparallel, above straight or nearly so, distinctly and considerably converging; anterior margin moderately wide, concurved at middle; gently convexly rounded at sides.

Legs long and rather stout; the metatarsi of the fourth legs moderately slender; two first pair of spines of anterior tibiae of moderate length, rather shorter than in *ocreata*. Anterior tarsi and also except basally being divided by a wide median setose band.

Septal piece of guide of *epigynum* of but moderate width, a little or sometimes considerably wider anteriorly than posteriorly, the transverse arms divided normally but little more than half way to their mesal ends, the incisions connected by a furrow; posterior divisions of transverse arms depressed, on each side with distal end bent sharply forward. (Pl. XVI, fig. 4.)

Total length, 9 mm. Length of cephalothorax, 4.7 mm.; width, 3.8 mm.

Length of leg I, 12.5 mm.; tib. + pat., 4.5 mm.; met., 2.3 mm.

Length of leg II, 11.7 mm.

Length of leg III, 11.5 mm.

Length of leg IV, 15.8 mm.; tib. + pat., 5 mm.; met., 4.5 mm.

Male.—Colored like female, the anterior legs not specially modified, chelicerae clothed with yellow and greenish pubescence. Legs considerably longer than in female, tibiae + patella of first pair clearly longer than the cephalothorax.

Tibiae of palpus a little longer and much thicker than the patella, nearly as wide as tarsus, sides more straight than in *ocreata*; tarsus as long as two preceding joints together. Exposed part of lunate area very small, situated at base and with convexity external; horn of conductor broad at base, conical; principal tenaculum external from middle, the lesser tenaculum at antero-exterior angle of conductor, small, bent a little downward apically; auricle of lectal fold bluntly and abruptly rounded apically. For other features see Pl. XVI, fig. 2.

Total length, 8.8 mm. Length of cephalothorax, 4.7 mm.; width, 3.9 mm.

Length of leg I, 16 mm.; tib. + pat., 5.4 mm.; met., 3.5 mm.

Length of leg II, 13.7 mm.

Length of leg III, 13.4 mm.

Length of leg IV, 19 mm.; tib. + pat., 5.8 mm.; met., 5.8 mm.

Syn.—1844. *Lycosa venustula* Hentz, J. Bost. Soc. Nat. Hist., IV, p. 392, Pl. XVIII, figs. 6 and 7.

1875. *Lycosa saltatrix* Hentz, Sp. of U. S. (Burgess Ed.), p. 28, Pl. 3, fig. 7.

— *Lycosa venustula* Hentz, Sp. of U. S., p. 33, Pl. 4, figs. 6, 7.

1892. *Lycosa humilis* Banks, Proc. Acad. Nat. Sci. Phila., Vol. 44, p. 65, Pl. III, fig. 36.

— *Pardosa gracilis* Banks, Proc. Acad. Nat. Sci. Phila., Vol. 44, p. 70, Pl. 1, fig. 50.

1902. *Lycosa relucens* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 542, Pl. 29, figs. 5, 6.

— *Lycosa charanoides* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 544.

— *Lycosa verisimilis* Montgomery, *ibid.*, p. 548, Pl. 29, figs. 11, 12.

1903. *Lycosa charanoides* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 646, Pl. XXIX, fig. 7.

— *Lycosa verisimilis* Montgomery, *ibid.*, p. 647.

1904. *Schizocosa venustula* (Hentz), Chamberlin, Can. Ent., XXXVI, p. 176.

— *Lycosa charanoides* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 286.

— *Lycosa relucens* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 292.

Type locality.—Alabama.

Known localities.—Alabama, North Carolina!, Georgia!, Louisiana!, Mississippi!, Texas!, District of Columbia!, Pennsylvania, Kansas!, New York!.

Hentz states that males of this species were common in Alabama in April, but that he did not find females. So also, it may be noted, all but a few of the specimens of rather extensive collections of this species, made at several places in the South in the early spring of 1903, which I have examined are males. The marking of the venter of the abdomen

figured by Hentz is strongly developed in some individuals, obscure or absent in others. In size and general coloration this species is much like *ocreata*, except as to the first legs of the males; and it has also approximately the same geographical range.

Schizocosa bilineata (Emerton), 1885.

(Sub *Pardosa*, Trans. Conn. Acad. Sci., VI, p. 496, Pl. 49, figs. 3 to 3*l*.)

Female.—Sides of *cephalothorax* dark reddish brown clothed with deep brown pubescence. A wide median yellow stripe of the usual form, darker, more reddish, in front of dorsal groove, extending between eyes of third row as usual; not geminated or only so for very little distance at front, usually a darker reddish line extending backward from inner side of each eye of third row, the two uniting in front of median groove; the band clothed in gray and light brown pubescence which is darker anteriorly; a narrow supramarginal stripe each side reaching to clypeus in front, the dark band below this stripe often more or less broken into spots by light cross-lines; some light radiating cross-lines from median stripe; eyes surrounded with black, the black extending across clypeus below each anterior lateral eye. *Chelicerae* brown, a gray-brown pubescence and longer black bristles. *Endites* yellow or light brown. *Labium* darker, brown to blackish. *Sternum* light brown or yellow, a row of dark spots each side of the middle, the two converging and meeting posteriorly, the margins also sometimes darker, clothed with grayish pubescence. *Coxae* of legs yellow. *Legs* yellow, somewhat darkened distally, entirely without dark annuli or other markings. Abdomen above light brown, enclosing at base a dark lanceolate outline ending at middle, and with behind on each side a row of several black spots, which are connected in pairs by narrow and often indistinct dark transverse lines; the dorsum densely clothed with light brown or gray-brown pubescence; a deep brown or black spot over each anterior lateral angle, the sides elsewhere also dark from the many dark spots which are often more or less arranged in rows, covered with brown pubescence, intermixed with gray in spots and streaks; venter yellow, covered with gray pubescence, with normally four dark longitudinal lines, all converging from furrow of lung slits toward the spinnerets. *Spinnerets* yellowish or pale brown. *Epigynum* pale brown with darker margins.

Face moderately high, a little more than two-thirds as high as the length of the chelicerae; sides scarcely convex, very steep, much as in *Pardosa*.

First row of eyes much shorter than the second, considerably pro-curved; anterior median eyes hardly their radius apart, about same distance from the lateral or but slightly farther; anterior lateral eyes as large as median or very nearly so, rather less than their diameter from front margin of clypeus, a little more than their diameter from eyes of second row; eyes of second row not their diameter apart, quadrangle of posterior eyes one-fourth as long as the cephalothorax; posterior eyes seen from above close to lateral margin of pars cephalica as in *Pardosa*.

Labium longer than wide in ratio of 4.6 : 4; basal notch one-third as long as labium; sides rounded below, straight and moderately converging above; anterior margin truncate, not at all curved. *Legs* of moderate length, short, not very slender distally; metatarsus of fourth legs as long as cephalothorax; tibia + patella of first leg shorter than cephalothorax; spines of anterior tibiae moderately long and slender, the first pair a little overlapping the second; anterior tarsi with well developed scopulae which are scarcely or but imperfectly divided, the posterior tarsi not at all scopulate, simply setose.

Septal piece of guide of *epigynum* broad, narrowest adjacent to transverse arms, distinctly widening anteriorly; the anterior branch of transverse arms of each side conspicuously enlarged distally, making the total width of the transverse arms conspicuously less adjacent to septum than extad. (Pl. XVI, fig. 3.)

Total length, 7.2 mm. Length of cephalothorax, 3.3 mm.; width 2.4 mm.

Length of leg I, 8.6 mm.; tib. + pat., 3 mm.; met., 1.7 mm.

Length of leg II, 8.2 mm.

Length of leg III, 8.2 mm.

Length of leg IV, 11.6 mm.; tib. + pat., 3 mm.; met., 1.7 mm.

Male.—General coloration like that of female; tibiae of first legs densely clothed for entire length with a brush of long black hair as in *ocreata*. Anterior lateral eyes but about half their diameter from front margin of clypeus, smaller than median; eyes of second row scarcely more than three-fourths their diameter apart.

Tibia of *palpus* longer and broader than the patella, of nearly same breadth from base to apex; tibia + patella a little longer than tarsus; the latter clearly wider than the tibia (3.25 : 2.5); the alveolus relatively large, the sides low and the bulb protruding; conductor high and rounded above at the exterior end, but no distinct horn-shaped process; principal tenaculum rather small, bluntly rounded apically; auricle of lectus very long, attaining or extending beyond front margin of alveolus.

Total length, 5.3 mm. Length of cephalothorax, 3 mm.; width, 2.2 mm.

Length of leg I, 8.7 mm.; tib. + pat., 3.2 mm.; met., 2 mm.

Length of leg II, 7.8 mm.

Length of leg III,

Length of leg IV, 10.6; tib. + pat., 3.4 mm.; met., 3.2 mm.

Syn.—1890. *Lycosa ocreata* Stone, but *nec* Hentz, Proc. Acad. Nat. Sci. Phila., Vol. 42, p. 427.

1892. *Pardosa bilineata*, Marx, Proc. Ent. Soc. W., Vol. 2, p. 161

1895. *Pardosa bilineata*, Banks, J. N. Y. Ent. Soc., Vol. 3, p. 91.

1902. *Lycosa ocreata pulchra* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 540, Pl. 29, figs. 3, 4.

1904. *Schizocosa bilineata* (Hentz), Chamberlin, XXXVI, p. 176.

——. *Lycosa bilineata* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 290.

Type locality.—Connecticut.

Known localities.—Connecticut, New York!, New Jersey, Pennsylvania, District of Columbia!, Illinois, Kansas!.

The Genus **LYCOSA** Latreille, 1804.

(Nouv. Dict. Hist. Nat., 24, p. 135.)

Entire body densely clothed with pubescence. Anterior tibiae armed beneath with three pairs of *spines* which are shorter than the diameter of the joint or at most but little longer, the third pair apical in position and smaller (Pl. IX, fig. 8). Anterior *eyes* in a row shorter than, of same length as or longer than the second, either procurved or straight, or rarely a little recurved, eyes equidistant or with the median a little farther from each other than from the lateral, the lateral usually a little smaller than the median; anterior lateral eyes mostly their diameter or but little more from front margin of clypeus, only rarely once and a half their diameter and never more, the same distance or farther from eyes of second row; eyes of second row large, less than their diameter apart; quadrangle of posterior eyes trapeziform, evidently wider behind than in front. *Labium* longer than wide, or at least never wider than long; either attenuated anteriorly or, less commonly, with sides subparallel; basal excavation long, in most fully one-third or more the total length (Pl. IX, figs. 7 and 9). *Spinnerets* short, the posterior ones not longer than the anterior, their apical segment indistinct. *Epigynum* in typical forms with a strongly developed guide, of which the septal piece is distinct and well formed anteriorly, its transverse arms not divided; openings of the spermatheca protected, leading into narrowed channels, the lateral furrows from these widening anteriorly, and at the front usually conspicuously wider

than behind (see, *e.g.*, figs. of Pl. XVII); in some the foveolæ subcircular, not thus elongate and widening conspicuously anteriorly (group *Trochosa*). Bulb of male palpus bearing at front of basal lobe a strongly chitinized special fold or scopus which is essentially exterior in position; scopus presenting two processes; viewed directly from below the inner of these appears usually as a more or less retrorse, barb-like process, but in some (group *Trochosa*) longer and strongly salient, the basal portion mostly more or less concealed by a basal fold which leaves only the apical, exterior portion visible in ventral aspect; median rim of conductor bearing one, or sometimes two, mostly slender and simple tenacula; a lectal fold well developed, an auricle of varying size, but always smaller than in *Schizocosa*. See, *e.g.*, figs. of Pl. XVII.

- 1832. *Lycosa* Hentz (ad. part. max.), Sill. J. Sci. and Arts, 21, p. 106.
- 1842. *Lycosa* Hentz (ad. part. max.), J. Bost. Soc. N. H., 4, p. 228.
- 1848. *Lycosa* (ad. part.), *Arctosa* and *Trochosa*, C. Koch, Die Arachniden, 14, pp. 94-98.
- 1869-70. *Tarentula* and *Trochosa* Thorell, On European Spiders, p. 192.
- 1875. *Lycosa* Hentz (ad. part. max.), Sp. U. S., pp. 11 and 24.
- 1876. *Lycosa* Simon (ad. part. max.), Arcahn. Fr., 3, p. 233.
- . *Tarentula* and *Trochosa* Keyserling, Verh. z. b. Ges. Wien, p. 610.
- 1877. *Tarentula* Thorell, Bull. U. S. G. S. Terr., 3, p. 520.
- 1885. *Lycosa* Emerton, Trans. Conn. Acad. Sci., 6, p. 482.
- 1890. *Tarentula*, *Trochosa* and ad. part. *Lycosa* Marx, Proc. U. S. N. M., 12.
- 1898. *Lycosa* Simon (ad. part. max.), Hist. Nat. Araign., 2.
- 1902. *Lycosa* (ad. part. max.), Proc. Acad. Nat. Sci. Phila., p. 536.
- 1903. *Lycosa* Comstock, Classif. of N. A. Spiders.
- 1904. *Lycosa* Chamberlin, Can. Entomologist, Vol. XXXVI, p. 176.
- . *Lycosa* (ad. part.), Montgomery, Proc. Acad. Nat. Sci. Phila., p. 276.
- . *Trochosa*, Montgomery (ad. part.), *ibid.*, p. 300.

Pars cephalica moderately elevated; in front truncate to more or less obtuse; its lateral margins either a little converging anteriorly or parallel; sides rounded outward below; face moderately high, trapeziform, evidently widening downward; in profile either vertical or sloping forward from top to the base of chelicerae (Pl. IX, fig. 5). Quadrangle of posterior eyes in most but one-fifth or less the length of the cephalothorax. Seen from above, the eyes of second and third rows are much more than their diameter from lateral margins of the pars cephalica (Pl. IX, fig. 2). *Chelicerae* long and robust, in length at least one and one-half times the height of the face; upper margin with three teeth of the usual proportions, or the first one rarely absent; lower margin with three stout teeth which are subequal, or with the third sometimes reduced, or else with two stout equal teeth (Pl. IX, figs. 1 and 3).

Legs robust, the distal joints usually not slender as in *Pardosa*. Tarsi and usually also metatarsi of anterior legs scopulate and with the

scopulae undivided (Pl. IX, fig. 4), the posterior tarsi scopulate at sides, being divided along the median ventral face by a setose or setose and spinulose band (Pl. IX, fig. 6). Metatarsus of fourth legs shorter than tibia + patella of same pair in most cases, rarely the metatarsus the longer more especially in males. Tibia + patella of last legs sometimes a little longer than and sometimes of same length as or, as in the great majority of cases, shorter than the cephalothorax.

Spiders of large or medium size, including the largest forms of the family. There is much variation in coloration, although in the several groups of species the same system or pattern of markings is more or less evident. Most of the larger North American species show a decided tendency to have the ventral surface of the body black in whole or in considerable part, such seeming indeed to be the tendency in large *Lycosidae* everywhere. The body of the males is in most cases smaller than that of the females, with the legs proportionately much longer and with their several joints of proportionately different lengths.

Lycosas make a white spherical cocoon which only exceptionally shows a seam about its equator, the tissue being normally smooth and homogeneous. The smaller species carry the cocoons about as do the *Pardosas*, which they resemble also in building no retreats. The larger species, however, during the cocooning season are sedentary. Practically all of these larger species make nests or burrows of some kind, these varying greatly in form and depth. Some of the burrows are deep and have the openings surrounded by a rampart or turret formed of sticks and leaves or of bits of dirt cemented together with silk (*e.g.*, *fatifera*, *arenicola*, *carolinensis*). Other species excavate only shallower pits or nests beneath stones or logs, and surround these excavations with a low rampart of earth or sticks, etc., and which they may occupy only during the cocooning season (*e.g.*, *helluo*).

The genus *Lycosa* as here considered is divisible into a number of groups; but for the most part these are found more or less closely to intergrade when a sufficient number of species are taken into consideration. The most aberrant and distinct of these groups, so far as concerns the American species, is that containing many of the forms referred to *Trochosa* C. K. (*avara* Keys., *gosiuta* new, *cinerea* Fab., *rubicunda* Keys., etc.). The material representing this group that I have been able to study (American forms only) has not been sufficiently extensive and complete to enable me to determine fully the characteristics and value of the group, and therefore the propriety or advantageousness of its separation generically. The forms studied differ from typical *Lycosas* among other features in having the epigyna as wide as or

wider than long with the guide more or less strongly arched at middle, and with the lateral depression, relatively wide and short, tending to subcircular; the lateral ridges commonly low at middle (Pl. XX, fig. 2, *avara*; Pl. XX, fig. 6, *cinerea*). In the male palpal organ the proximal limb of scopus is more strongly developed, being more or less elongate and bent out vertically as a conspicuously salient process (Pl. XX, fig. 1, *avara*). Some but not all species in the group have the stout spine, normally present above at proximal end of the tibiæ of the third and fourth legs in *Lycosa*, replaced by a very elongate, basally stout bristle clearly stouter at base than surrounding hairs, spine-like, but distally gradually extending into a long fine awn. Through some forms of this group a close approach is made to *Allocosa*, which may ultimately have to be withdrawn into the present genus.

KEY TO SPECIES OF LYCOSA.

1. Venter of abdomen black in front of genital furrow and in a spot at base of spinnerets, elsewhere pale brown, . . . *coloradensis* Bks.
Not so, 2.
2. Lower margin of furrow of chelicera armed with but two teeth, . . . 3.
Lower margin of furrow armed with three teeth, 4.
3. Anterior lateral eyes their diameter from front margin of clypeus, . . . *kochii* (Keys.).
Anterior lateral eyes once and one-half their diameter from front margin of clypeus, *beanii* Em.
4. No spine at all above on tibiæ of legs III and IV, 5.
Spine at middle or both at middle and at proximal end on tibiæ of legs III and IV, 6.
5. Dorsum of abdomen with a distinct median dark band along its entire length; light median band on cephalothorax, *arenicola* Sc.
Dorsum of abdomen without such a dark band; cephalothorax without distinct markings, *fatifera* Htz.
6. No true stout spine at base above on tibiæ of legs III and IV, replaced by a basally stout, apically slender and pointed, elongate bristle, 7.
A true robust spine at base above on tibiæ of legs III and IV, . . . 10.
7. Tibia + patella of legs IV less than 3 mm. long, *floridiana* (Bks).
Tibia + patella of legs IV near 4 mm. long or longer, 9.
9. Eyes upon a black patch; legs not marked with dark annuli, . . . *cinerea* Fab.
Eyes not upon a black patch; legs marked with dark annuli, . . . *rubicunda*.
10. Cephalothorax with a light median longitudinal stripe which is very narrow or line-like anteriorly and which extends forward to or between eyes of second row, 11.
Cephalothorax either without a median band or with a band which is as wide or nearly as wide as the third eye row, . . . 18.

11. Legs strongly banded with black, or if, annulations are indistinct,
legs entirely black, 12.
Legs yellow or light brown, not at all annulate or with a few dark
markings on femora, 13.
12. Anterior row of eyes as wide as or a little wider than the second,
aspersa H.
Anterior row of eyes shorter than the second, *riparia* H.
13. Males, 14.
Females, 18.
14. Cephalothorax near 10 mm. in length (leg IV not more than 3.25
times as long as cephalothorax), *permunda* Chamb.
Cephalothorax under 7.5 mm. in length (leg IV 3.7 or more
times as long as cephalothorax), 15.
15. Tibia + patella I longer than tibia + patella IV, . . . *grandis* Bks.
Tibia + patella I shorter than tibia + patella IV, . . . *helluo* W.
16. Leg IV less than three times the length of cephalothorax,
permunda Chamb.
Leg IV more than three times the length of cephalothorax, . . . 17.
17. Abdomen beneath and the sternum immaculate pale yellow,
clothed with yellow hair, *grandis* Bks.
Sternum mostly black or nearly so and clothed largely with black
hair; abdomen beneath mostly with numerous dark dots and
sometimes nearly black, *helluo* W.
18. Dorsum of abdomen marked along its entire length by a distinct
median dark band, 19.
Abdomen not so marked, 20.
19. Sternum yellow or light brown; dorsal dark band of abdomen,
usually with margins behind dentate or else enclosing along each
side a series of small oblique light spots, *scutulata* H.
Sternum black; dorsal band of abdomen with margins always
straight and not dentate or enclosing light spots behind,
punctulata H.
20. Cephalothorax entirely without light bands or spots either at
middle or along sides, 21.
Cephalothorax with at least a median lighter band or spot, . . . 22.
21. Sternum and coxæ of legs and usually entire venter of abdomen
black; both ends of tibiæ of legs beneath black, . . . *carolinensis* W.
Sternum light to reddish brown, not black; venter of abdomen
not black either in whole or in part, *quinaria*.
22. Tibiæ of fourth legs black at both ends beneath, other tibiæ and
legs elsewhere unmarked excepting faint brown cross-bars on
femora (sternum and venter of abdomen entirely black),
apicata Bks.
Not so, 23.
23. Legs pale brown and entirely without darker markings; venter
behind genital furrow black, rarely a pale central spot, *lenta* H.
Legs similar, but patellæ and often distal end of tibiæ black
beneath; anterior femora above and posteriorly with fine
longitudinal dark lines, posterior femora with faint dark spots;
venter as for preceding, *lenta* var. *baltimoriana* (K.).

- Not as for *lenta* or its variety, 24.
24. All tibiae black at both ends beneath and the femora black beneath at distal end; large, the cephalothorax 10 mm. or more in length, *carolinensis* W.
Tibiae and femora not banded thus at ends only beneath; cephalothorax less than 10 mm. long, 25.
25. Females, 26.
Males, 34.
26. Lateral depressed areas of epigynum wide, subcircular, not elongate in the usual way, 27.
Epigynum not so, 28.
27. Guide bearing a short blunt median process posteriorly; ends of transverse arms not extending forwards freely to or beyond middle of lateral depression or fovea (Pl. XIX, fig. 2), *avara* (Keys.).
No such short median process posteriorly on guide; ends of transverse arms of guide extending forward uncovered to beyond middle of depressed fovea (Pl. XIX, fig. 4), *avara* var. *gosiuta* new.
28. Guide of epigynum inversely T-shaped, the transverse arms relatively slender, 29.
Guide enlarged at posterior end, but not inversely T-shaped or anchor-shaped, 33.
29. Septum of guide strongly widening from base of transverse arms to anterior end, where it extends entirely or nearly across the median depression, 30.
Not so, 31.
30. Confining walls of epigynum very wide anteriorly (Pl. XXI, fig. 3), *pratensis* Em.
Not so, the epigynum much like that of *helluo* (Pl. XVII, fig. 1), *floridana* Bks.
31. Transverse piece of guide extending entirely across or almost entirely across epigynum behind, some longer than median piece, scarcely confined by side ridges at ends (Pl. XVIII, fig. 4), *frondicola* Em.
Transverse piece of guide not so long, distinctly confined by ridges at ends, 32.
32. Septum widest at its anterior end; lateral walls thick; epigynum as a whole rather wider than long, *modesta* Keys.
Not so, septum widest toward middle part of its length, transverse arms usually excavated at ends above; epigynum as a whole roughly triangular, being much narrowed anteriorly (Pl. XVII, fig. 3), *erratica* H.
33. Enlarged end portion of guide roughly triangular in shape with the apex behind (Pl. XIX, fig. 8), *pictilis* Em.
Expanded end of guide not so shaped, widest behind, where it is truncate (Pl. XXI, fig. 7), *gulosa* W.
34. Anterior row of eyes shorter than the second, 35.
Anterior row of eyes as long as or longer than the second, 40.

35. Median pale band of cephalothorax strongly widening anteriorly, passing each side of the eyes and reaching to the clypeus, the full width of which it embraces, *albohastata* Em.
 Median pale band of cephalothorax not thus in front wider than and enclosing eye area, 36.
36. Embolus curving out ventralwards and forward, resting only its apical part obliquely across the auricle (Pl. XXI, fig. 4),
gulosa W.
 Not so, 37.
37. Median pale stripe strongly bulging between third eye row and anterior end of dorsal groove, being much wider than third eye row; at front of furrow abruptly narrowed to the width of third eye row, its sides then subparallel to posterior declivity,
pictilis Em.
 Median pale band of cephalothorax not so formed, 38.
38. Dorsum of abdomen with a median light band extending to spinnerets behind, where it ends in a point, enclosing at base a dark lanceolate mark, or with the latter sometimes absent, *erratica* H.
 No such distinctly limited light band on dorsum of abdomen, 39.
39. Venter mostly black, *modesta* (K.).
 Venter brown to yellowish, *avara* (K.).
40. Venter with a wide irregularly edged black band extending from epigynum to spinnerets and sometimes embracing entire width of abdomen, *frondicola* Em.
 Venter with no such broad black band, *pratensis* Em.

Lycosa helluo Walckenaer, 1837.

(Insect. Apt., I, p. 337.)

Female.—*Cephalothorax* deep brown, a narrow light colored median pale stripe which anteriorly becomes line-like and extends forward between the eyes, this median stripe in life covered with light brown pubescence which continues as a median line between the eyes and to the front margin of the clypeus; in most a short curved light line behind each eye of third row and close to the median line; a wider similarly colored and clothed light supramarginal stripe on each side, this stripe usually not distinguishable in front of third eye row; eyes enclosed in black; dark parts of cephalothorax clothed with brown and black hair intermixed, the black most abundant over, and giving its deeper color to, the upper parts of the sides along the borders of the median pale stripe and the area about the eyes. *Chelicerae* black or brownish black, the lateral condyles red at base and black below; clothed with a short yellowish pubescence with some longer, gray-black bristles intermixed, the latter being more numerous distally and forming the dense fringe along the superior margin of the furrow. *Labium* and *endites* black, brown at distal ends. *Sternum* and *coxae*

of legs beneath black or brownish black, subdensely clothed with blackish hair, the longer ones of which appear lighter distally. *Legs* yellow or light brown, of usually a distinctly greenish tinge, becoming darker with age; femora paler beneath; in adults in most cases entirely without any dark annuli or other markings or with some narrow, mostly faint darker-cross marks on the femora above (for young specimens *vid. note infra.*); clothed with short appressed fine hairs of yellow, and longer black hairs; scopolæ black. *Abdomen* dark brown; above with a black median basal mark which widens from its base to its middle, where it projects on each side in a pointed angle or line, and then narrows to its apex which bifurcates, sending a narrow pointed line caudo-laterally on each side, the margins of the stripe deeper colored than central portion; a short distance back of the apex of the basal mark is a black angular or chevron-shaped transverse mark; and following this behind over the posterior part of dorsum is a series of light brown or yellow chevron-lines, each of which terminates at each of its ends in a circular spot of the same color; each light chevron-line bordered in front by a black line of similar form; lateral part of dorsum mixed black and brown, a large black spot over each antero-lateral angle; sides mostly dark brown with many small spots of yellow and of black; lower parts of sides and the venter brown to yellow with numerous small dots of black, less commonly immaculate, and at other times almost entirely black; abdomen densely clothed with black and yellow hair intermixed, the one predominating on the dark markings, the other on the light. *Spinnerets* brown. *Epigynum* dark reddish brown.

Face rather low, its sides convex and strongly oblique; pars cephalica not elevated above pars thoracica, the dorsal line but little sloping from the third eye row to the posterior declivity, not depressed at middle.

Anterior row of *eyes* nearly as long as the second, a little procurved; anterior median eyes distinctly larger than the lateral, less than their radius apart, about an equal distance from the lateral eyes; anterior lateral eyes separated from the front margin of the clypeus by once and a third their diameter, or little more, the same distance from eyes of second row; eyes of second row three-fourths their diameter apart; cephalothorax 5.5 to 6 times as long as the quadrangle of posterior eyes.

Chelicerae with margins of furrow armed as usual, the first tooth of the inferior margin often with its lower part concealed by a marginal keel extending from base of claw. *Labium* longer than wide (9.5 : 8.75); basal excavations one-third the total length; sides rounded below, above nearly straight, converging to the front margin which is widely

truncate or slightly incurved mesally. *Legs* long and stout, tibia + patella of fourth legs distinctly longer than the cephalothorax, the latter being a little longer than tibia + patella of first legs; tarsi of first legs a little curved, those of second legs more slightly so; patella of first legs unarmed; patella of second legs with a single spine on anterior side; spines of anterior tibiæ as usual; both tarsi and metatarsi of three anterior pairs of legs scopulate; scopulæ of third and fourth pairs divided.

Epigynum somewhat oval in outline, with posterior end truncate; guide inversely T-shaped, the septal part enlarging at or above its middle; guide plates widest on transverse arms, narrowing and fading out at middle of septum; furrows broad anteriorly, narrowed strongly behind by the abrupt bulging in of the lateral tubercles. (Pl. XVII, fig. 1.)

Total length, 19.5 mm. Length of cephalothorax, 8.2 mm.; width, 6.8 mm.

Length of leg I, 22.8 mm.; tib. + pat., 8 mm.; met., 4.5 mm.

Length of leg II, 20.2 mm.

Length of leg III, 19.3 mm.

Length of leg IV, 27.8 mm.; tib. + pat., 9 mm.; met., 7.8 mm.

Male.—Much smaller than the female with relatively longer legs. *Cephalothorax* above and *legs* nearly as in the female or lighter. *Sternum* usually more brownish, often divided by a median light line; clothed with long light gray hair. *Coxæ* of legs beneath light brown like the other joints of legs. *Abdomen* colored above as in the female; lower portion of sides and the venter lighter yellow or grayish brown, immaculate or nearly so. *Palpi* yellowish brown, the tarsus darker.

Viewed from above, the tibia is scarcely longer than the patella and is of the same thickness; the tarsus equalling the length of the two preceding joints together; apical portion of tarsus long, seen from below very gradually attenuated, not acute apically. Tenaculum long and slender; projecting ecto-distally, a smaller but similar secondary tenaculum mesally from this and commonly in part or whole concealed. For further structure of bulb see Pl. XVII, fig. 2.

Total length, 11.2 mm. Length of cephalothorax, 5.7 mm.; width, 4.2 mm.

Length of leg I, 17.8 mm.; tib. + pat., 6.1 mm.; met., 4.1 mm.

Length of leg II, 15.8 mm.

Length of leg III, 13.9 mm.

Length of leg IV, 21.2 mm.; tib. + pat., 6.6 mm.; met., 6.1 mm.

Syn.—1837. ?*Lycosa sayi* Walckenaer, Insect. Apt., 1, p. 337.

1846. *Lycosa babingtoni* Blackwall, Ann. and Mag. N. H., 17, p. 30.

1848. ?*Lycosa vafra* (C. Koch), Die Arachn., 14, p. 135, Pl. 490, fig. 1365.
 1876. *Trochosa helvipes* Keyserling, Verh. z. b. Ges. Wien, 26, Pl. 7, figs. 35, 36, and Pl. 8, fig. 37.
 1885. *Lycosa nidicola* Emerton, Tr. Conn. Acad. Sci., 6, p. 482, Pl. 46, figs. 1 to 1d.
 1890. *Lycosa babingtoni*, Marx, Proc. U. S. N. M., 12, p. 561.
 —. *Lycosa helluo*, Marx, *ibid.*, p. 562.
 —. *Lycosa nidicola*, Marx, *ibid.*, p. 562.
 —. *Lycosa nidicola*, Stone, Proc. Acad. Nat. Sci. Phila., 42, p. 424.
 1891. *Lycosa babingtoni*, Banks, Ent. News, 2, p. 193.
 1892. *Lycosa nidicola*, Banks, Proc. Acad. Nat. Sci. Phila., 44, p. 64.
 —. *Lycosa similis* Banks, *ibid.*, p. 64, Pl. II, fig. 30.
 —. *Lycosa crudelis* Banks, *ibid.*, p. 66, Pl. 3, fig. 37.
 —. *Lycosa nidicola*, Marx, Proc. Ent. Soc. W., 2, p. 160.
 —. *Lycosa nidicola*, Fox, *ibid.*, p. 269.
 1895. *Lycosa babingtoni*, Banks, J. N. Y. Ent. Soc., 3, p. 91.
 —. *Lycosa babingtoni*, Banks, Ent. News, 6, p. 205.
 1898. *Lycosa babingtoni*, Banks, Proc. Cal. Acad. Sci., p. 268.
 1900. *Lycosa babingtoni*, Banks, Proc. Acad. Nat. Sci. Phila., p. 538.
 1902. *Lycosa helluo*, Banks, Proc. Acad. Nat. Sci. Phila., p. 586.
 —. *Lycosa nidicola* Emerton, Common Sp. U. S., p. 69, figs. 166, 167.
 —. *Lycosa nidicola*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 559, Pl. 29, figs. 23, 24.

Type locality.—New York.

Known localities.—Massachusetts, Connecticut, Rhode Island!, New Hampshire!, New York!, Pennsylvania, New Jersey, Maryland, District of Columbia!, Alabama, North Carolina, Georgia, Louisiana, Texas!, Mississippi, Ohio, Indiana!, Illinois!, Iowa!, Kansas!, Colorado, Utah!.

One of the commonest and most widely distributed species, which is subject to much variation in size and in depth of coloration. Because of the abundance of this species it will be well to indicate the color differences presented by partly grown individuals. These have the sternum yellow with a narrow black stripe each side of middle line, the two converging and uniting in front of posterior margin, and also a row of small black dots along each lateral margin; the legs with numerous annulations which are present on all joints except tarsi, with sometimes indications of a median one on these; cephalothorax and abdomen above nearly as in adults; venter yellow with black dots minute.

The female *L. nidicola* builds a shallow excavation or nest under logs and stones along roadsides and in the woods. She lines the nest with silk and often surrounds it with a low rampart of earth or of sticks and leaves. They are frequently met with in these nests with their cocoons in early summer.

Lycosa grandis Banks, 1894.

(J. N. Y. Ent. Soc., p. 49.)

Female.—Coloration and pattern of markings as in *helluo*, but lighter

throughout. Median pale stripe of cephalothorax clothed with golden brown pubescence with some gray behind and brown at middle part intermixed; sides clothed with brown and golden brown pubescence intermixed; lateral pale stripes with mostly light gray pubescence, less of brown. *Legs* clear yellowish, the two first pairs of legs darker, more reddish brown distally. *Sternum* and coxæ of legs beneath yellowish brown, like legs, clothed, like the legs also, with grayish yellow intermixed with longer black hairs. *Abdomen* much lighter than in typical Eastern form of *helluo*; dorsum with the typical markings, but these paler and less distinct; the venter pale yellow without markings of any kind, clothed with yellow pubescence. *Epigynum* reddish black. *Spinnerets* pale brown.

Structure and proportions and the relations of the *eyes* as in *helluo*. *Epigynum* agreeing in detail with that of *helluo* (Pl. XVII, fig. 1). A specimen from Baja California gave the following measurements:

Total length, 24 mm. Length of cephalothorax, 10.2 mm.; width, 8 mm.

Length of leg I, 25.9 mm.; tib. + pat., 9.8 mm.; met., 5 mm.

Length of leg II, 24 mm.

Length of leg III, 23.7 mm.

Length of leg IV, 33.8 mm.; tib. + pat., 11 mm.; met., 9.6 mm.

Male.—Lighter than the female. *Chelicerae* pale yellow with light gray or whitish pubescence which is moderately long. *Palpi* pale yellow, the tarsus not darker; tarsus clothed with dense white hair, which occurs also less densely upon the tibia; the patella and femur clothed with yellow hair with some white more sparsely intermixed. *Sternum* and coxæ of legs pale yellow, these and the *legs* clothed with light yellow gray pubescence with some black hairs intermixed. *Abdomen* with basal dark mark as usual; middle region of dorsum yellowish, clothed with gray-yellow and brown pubescence intermixed, with on each side behind a row of about six spots of white hair; venter yellow with light gray pubescence.

Tibia + patella of first legs longer than tibia + patella of fourth ones. Tarsus of *palpus* shorter than the two preceding joints together. Structure of palpal organ agreeing in detail with that of *helluo* (Pl. XVII, fig. 2).

A male from Lower California gave the following measurements:

Total length, 14.2 mm. Length of cephalothorax, 7.6 mm.; width, 6.1 mm.

Length of leg I, 27.2 mm.; tib. + pat., 9.8! mm.; met., 6.3 mm.

Length of leg II, 22.9 mm.

Length of leg III, 22.2 mm.

Length of leg IV, 30.3 mm.; tib. + pat., 9.2! mm.; met., 8.8 mm.

Syn.—1895. *Lycosa grandis* Banks, Ann. N. Y. Acad. Sci., 8.

1898. *Lycosa grandis* Banks, Proc. Cal. Acad. Sci.

Type locality.—Colorado.

Known localities.—Colorado; Baja California!.

So far as I have determined, tibia + patella of fourth legs of the male in Eastern specimens of *helluo* is longer than tibia + patella of first pair or sometimes, in *large specimens*, of the same length, whereas the reverse is seen to be true in *grandis*. But as the relative lengths of these two pairs of joints varies in *helluo* and apparently with the size of the individual, the increased relative length of tibia + patella of the first pair, and in fact of the entire first leg, may not be of much significance. The agreement between *helluo* and *grandis* is thus close excepting in color and size, and it might therefore be more proper to place the latter as a variety under the former.

Lycosa floridana Banks.

(Trans. Am. Ent. Soc., XXIII, p. 72.)

Female.—*Cephalothorax* with a median light colored longitudinal band which anteriorly is geminated and is nearly as wide as the eye area, with on each side a narrow supramarginal light brown stripe which is discontinuous, being broken into four or more parts. *Chelicerae* dark reddish brown. *Sternum* brown, with a black mark along middle. *Legs* brown, with the distal joints darker, blackish brown; femora above with some rather obscure black marks. *Coxae* brown, all with a black, very distinct line along front face. *Abdomen* above black; sides and lateral part of venter blackish over a yellow ground, mixed yellow and black; venter yellow.

Cephalothorax low, its dorsal line straight and but slightly slanting from the third eye row to the posterior declivity, which is short and steep. *Face* in height more than half the length of the chelicerae, sides slanting moderately outward from above downward.

Anterior row of *eyes* shorter than the second, rather strongly procurved.

Chelicerae armed as usual.

Epigynum relatively small, .8 or .9 mm. long; in form and structure very similar to that of *helluo*, but the septum of guide broader and more strongly expanded anteriorly, where it almost extends across the entire depressed area.

Length, 14.2 mm. Length of cephalothorax, 6 mm.; width, 4.3 mm.

Length of leg I, 13 mm.; tib. + pat., 6 mm.; tarsus, 2.1 mm.

Length of leg II, 11.7 mm.

Length of leg III, 11 mm.

Length of leg IV, 15.6 mm.; tib. + pat., 7 mm.; tarsus, 3 mm.

Locality.—Florida!.

***Lycosa apicata* Banks, 1904.**

(Journ. N. Y. Ent. Soc., p. 114, Pl. V, fig. 13.)

Female.—*Cephalothorax* brown, marked with a median paler band as wide anteriorly as the third eye row, between the eyes of which it extends in a tongue-like process forward, this narrower process in life clothed with white hair; the median band constricted at the dorsal groove and extending from there down the posterior declivity as narrower stripe; on each side beginning mesally from the eye of the third row a dark line extends posteriorly through the median pale band to the point of its constriction where it unites with the dark of the sides; a narrow, anteriorly interrupted, supramarginal pale stripe with dentate margin. *Chelicerae* deep chestnut or reddish black. *Labium* and *endites* reddish black, the former a little paler apically. *Sternum* and *coxae* of legs beneath black. *Legs* light brown; the femora with darker markings which are more distinct on the posterior pairs; tibiae of fourth legs black at each end beneath, the metatarsi sometimes also darkened distally; legs elsewhere without evident markings. *Abdomen* above light brown or yellowish; a dark, black-edged, spear-shaped mark which is laterally dentate and blunt or forked at its posterior end; the spear-mark followed posteriorly with a series of dark chevron-shaped transverse marks, which may be separated by corresponding transverse marks of white hair, the chevrons commonly confluent laterally with dark mottlings at the sides and thereby with each other, in other cases confluent mesally with each other and with the basal mark; sides of abdomen above with spots and streaks of brown, pale below; venter entirely black.

Cephalothorax highest at the third eye row, the dorsal line as seen in profile from there a little sloping and nearly straight to the posterior declivity. *Face* relatively low, its sides moderately slanting outward from above below.

Anterior row of *eyes* clearly shorter than the second, a little procurved; anterior median eyes less than their radius apart, about the same distance from the lateral eyes, which are smaller than the median. *Eyes* of the second row less than their diameter apart.

Patellæ of first and second pairs of *legs* armed in front with a short spine. Tibia + patella of first legs about equalling the cephalothorax in length; tibia + patella of fourth legs clearly longer than the cephalothorax and also longer than the metatarsus of same legs.

Chelicerae armed as usual, the three teeth of lower margin stout.

The *epigynum* having the general form and structure of that of *L. helluo* (Pl. XVII, fig. 1); septum widest anteriorly, its sides nearly straight; transverse arms rather thick.

Total length, 13.5 mm. Length of cephalothorax, 6.3 mm.; width, 4.8 mm.

Length of leg I, 19.3 mm.; tib. + pat., 6.2 mm.; met., 3.8 mm.

Length of leg II, 16.2 mm.

Length of leg III, 16.2 mm.

Length of leg IV, 23.5 mm.; tib. + pat., 7 mm.; met., 6.7 mm.

Male.—Coloration as for the female; but the markings more distinct.

Palpal organ of the general type of that of *L. helluo* (Pl. XVII, fig. 2). The auricula conspicuous, more strongly chitinized than usual, dark in color, turned outward apically. Principal tenaculum relatively shorter, and more outwardly directed than in *helluo*.

Total length, 13 mm. Length of cephalothorax, 6.8 mm.; width, 5 mm.

Length of leg I, 20.7 mm.; tib. + pat., 7 mm.; met., 4.8 mm.

Length of leg II, 19.1 mm.

Length of leg III, 19.1 mm.

Length of leg IV, 25.4 mm.; tib. + pat., 7.8 mm.; met., 7.6 mm.

Syn.—1904. *Lycosa antelucana* Montgomery, Proc. Acad. Nat. Sci. Phila. p. 282, Pl. XVIII, figs. 5 and 6.

Type localities.—Arizona and Texas.

Known localities.—Arizona!, Texas!, New Mexico.

The descriptions above are from type specimens.

Lycosa permunda Chamberlin, 1904.

(Can. Entomologist, p. 286.)

Female.—*Cephalothorax* dark brown; a pale narrow median line extending backward from first eye row, widening abruptly in front of dorsal groove, and then gradually narrowing to a point at posterior margin; a broad light-colored marginal stripe on each side not extending forward farther than the third eye row, its upper margin coarsely dentate, the lower border broken by a few dark dots, but not limited below by a continuous dark line or stripe at margin. *Chelicerae* black. *Labium* and *endites* dark brown. *Sternum* dark brown, with a yellow

median line. *Legs* brown, darker distally; beneath unmarked, but having a number of dark cross-bars above on femora and posterior tibiae. *Abdomen* above dark, having the usual lanceolate mark at base, followed by a series of light colored, chevron-formed transverse lines, each ending on each side in a light dot; sides yellowish brown, densely spotted with black; venter also yellowish brown, more sparsely covered with smaller black dots, much as in *helluo*.

Length, 22 mm. Length of cephalothorax, 10.7 mm.; width, 8 mm. Length of leg IV, 30.3 mm.

Male.—Colored nearly like the female, but paler throughout. Marginal stripes of cephalothorax not interrupted below by dark spots. Legs clear brown, without any cross-marking on any joints. Palpi yellowish brown excepting tarsus, which is black.

Length, 20 mm. Length of cephalothorax, 10 mm.; width, 7.5 mm. Length of leg IV, 32.4 mm.

Locality.—Kansas!.

In general appearance the female resembles *helluo*, but is easily separated by structure of epigynum and by various other characters. The male is conspicuously different in its palpal organ and in size, proportion and structure from those of related species.

Lycosa riparia Hentz, 1844.

(J. Bost. Soc. N. H., IV, p. 289.)

Female.—*Cephalothorax* with a narrow median light band, widest at dorsal groove, narrowing anteriorly and continuing as a distinct line between eyes to the clypeus; median band formed of grayish-yellow pubescence; tegument of cephalothorax elsewhere deep brown or reddish brown, black over eye area, clothed with black pubescence, intermixed with fewer yellowish or brownish-gray hairs which are more abundant below but form no distinct band; rufous hairs about the eyes and on the face. *Chelicerae* black with rufous pubescence over upper half and black pubescence below. *Labium* and *endites* black, brown at tips. *Sternum* and *coxae* of legs beneath black with longer and stiff black hairs and some short gray pubescence. Ground color of tegument of *legs* dark reddish brown; the tarsi and metatarsi darker, all joints except these two with distinct light and dark rings, the latter being broader, clothed respectively with grayish-brown and black pubescence, tarsi and metatarsi appearing entirely black because of black scopulae and black pubescence, the shorter brown hairs being few. *Abdomen* above grayish brown, with scattered minute spots of black pubescence; a number of black chevron-marks behind and in

front an indistinct outline of a lanceolate mark behind a chevron which is commonly divided mesally into two triangular marks; near the middle of lanceolate outline on each side, the dark line more strongly impressed as a black triangular mark with apex forward; a light spot laterally from upper part of basal mark; behind on each side a series of light spots which may be indistinct; front face of abdomen and antero-lateral angles black; sides dark above, having black pubescence intermixed with brown in fine spots and streaks; in middle the sides are lighter, the brown pubescence being in larger spots. The venter and commonly the lower part of sides black, but, especially at sides, with spots of brown; often brown pubescence in four narrow lines on venter, converging from lung slits to spinnerets, divide the black of venter into three contiguous bands, much as in *aspersa*. *Spinnerets* brown. *Epigynum* black or reddish black.

Face moderate in height, hardly one-half the length of the massive chelicerae. *Cephalothorax* above nearly straight and horizontal or but little convex between third row of eyes and posterior declivity; the posterior declivity short, only posterior end of dorsal groove being upon it; sides rather strongly bulging behind; sides of face convex and strongly slanting.

First row of *eyes* straight or very nearly so, shorter than second row; anterior median eyes distinctly larger than the lateral, less than their radius apart, closer to the lateral eyes; anterior lateral eyes removed from front margin of clypeus and from eyes of second row by about once and a half their diameter; anterior median eyes less than their diameter from eyes of second row; eyes of second row less than their diameter apart (about three-fourths); quadrangle of posterior eyes about one-fifth as long as the cephalothorax.

Legs long; tibia + patella of fourth legs a little longer than cephalothorax and also longer than metatarsus of same legs; tibia + patella of first pair of same length as cephalothorax; patella of first legs unarmed, patella of second armed anteriorly with a single spine; tibia and metatarsus armed as usual; scopulae on anterior tarsi and metatarsi as usual; scopulae of posterior tarsi divided by setose bands as usual.

For form *epigynum* see Pl. XVII, fig. 5.

Total length, 18.5 mm. Length of cephalothorax, 9 mm.; width, 6.9 mm.

Length of leg I, 24.5 mm.; tib. + pat., 9 mm.; met., 8.5 mm.

Length of leg II, 22.8 mm.

Length of leg III, 21.4 mm.

Length of leg IV, 29.6 mm.; tib. + pat., 9.3 mm.; met., 8.5 mm.

Male.—For structure of *palpal organ* see Pl. XVII, fig. 6.

Syn.—1875. *Lycosa riparia* Hentz, Sp. U. S., p. 31, Pl. 3, figs. 13, 15.

— . *Lycosa riparia*, Cragin, Contrib. to Knowl. Arachn., Kansas Bull., Washburn, Coll. 1, No. 4, p. 146.

1890. *Lycosa riparia*, Marx, Proc. U. S. N. M., 12, p. 563.

1900. *Lycosa riparia*, Banks, Proc. Acad. Nat. Sci. Phila., p. 539.

Type localities.—North Carolina, Alabama.

Habitat.—North Carolina!, South Carolina, Alabama!, Georgia!, Louisiana!, Mississippi, Virginia, West Virginia, District of Columbia!, Kansas, Texas.

“This common spider is aquatic in its habits, always found near or on water, and diving with ease under the surface when threatened or pursued” (Hentz).

***Lycosa aspersa* Hentz, 1844.**

(Bost. Journ. Nat. Hist., IV, p. 389, Pl. XVII, figs. 11, 12.)

Female.—*Cephalothorax* dark reddish brown, blackish about the eyes; a lighter uneven-edged marginal band on each side, and a similarly colored narrow median stripe more or less distinct; sides of cephalothorax densely clothed with black pubescence with more scattered hairs of yellowish intermixed; the narrow median stripe clothed with yellowish or golden-brown hair, which forms a bright stripe which continues forward as a line between the eyes and reaches the anterior row, the stripe expanding posteriorly about the dorsal groove and then again narrowing down the posterior declivity to the posterior margin; the middle stripe of pubescence sometimes obscure in middle region, but always bright at anterior and posterior portions; along each side similar yellowish hair forms a narrow marginal stripe which is narrower than the broader supramarginal stripe of tegument; front margin of clypeus at middle with a fringe of yellowish hair. *Chelicerae*, including claws, black, clothed with moderately long black pubescence without any short paler hairs. *Endites* and *labium* brown-black, lighter at tips. *Sternum* black, a narrow light colored median line anteriorly; clothed with black hair. *Coxae* of legs beneath black, lighter, yellowish brown, laterally, at base beneath a similarly colored light spot which is mostly acutely pointed distally. *Legs* brown, of light shade in young specimens, becoming dark reddish brown with age, deeper colored distally; all joints excepting the tarsi and the metatarsi with light cross-bands which are distinct above, especially on femora, but which may be obscure beneath; light rings much more distinct in young specimens than in old, and in the latter on the posterior pairs of legs than on the anterior; legs densely clothed with long black hairs intermixed with shorter yellowish pubescence, the latter mostly confined to the lighter bands in tegument.

Abdomen above very dark; a basal black mark with end behind forked and followed by a series of chevron-marks, all the marks usually indistinct in older specimens, in which the entire dorsum is black or nearly so; dorsum clothed in life with black and grayish-brown pubescence, the lighter pubescence more concentrated anteriorly and antero-laterally, and also forming some mostly obscure transverse chevron-marks behind; in dark specimens the sides are dark or black-streaked and spotted below with yellow pubescence, with the yellow sometimes predominating over the black; venter with numerous spots and streaks of yellow pubescence usually arranged mostly in four lines or stripes converging to the spinnerets, and thus dividing the dark into three bands similarly converging caudally. *Spinnerets* brown. *Epigynum* reddish brown.

Face rather low, not fully half as high as the chelicerae are long, the latter long and massive, considerably longer than the face is wide in front. *Cephalothorax* not high, dorsal line highest at third eye row, from there being nearly straight to the posterior declivity.

Anterior row of *eyes* as wide as or slightly wider than the second, nearly straight; anterior median eyes less than their radius apart, about as far from lateral eyes; anterior lateral eyes a little more than two-thirds as large in diameter as the median, once and one-half their diameter from front margin of clypeus, closer to eyes of second row; eyes of second row a little less than their diameter apart; eyes of third row three-fourths as large as the second, twice as far from each other as from the second; cephalothorax 6.5 times the length of the quadrangle of posterior eyes.

Chelicerae armed as usual. *Labium* longer than wide (8.5 : 8); basal excavation as usual; sides strongly convexly bulging, the curvature less above than below; front margin wide, concave for nearly entire width (Pl. IX, fig. 9). *Legs* stout; tibia + patella IV shorter than the cephalothorax; metatarsus IV of nearly same length as the width of the cephalothorax; tarsi I and II slightly curved, III and IV straight; tarsi scopulate as usual, the scopulae on legs I and II extending also over metatarsi and over all but basal portion of tibiae; spines of tibiae as usual.

For structure of *epigynum* see Pl. XVII, fig. 7.

Total length, 23 mm. Length of cephalothorax, 10.6 mm.; width, 8.2 mm.

Length of leg I, 25.6 mm.; tib. + pat., 9.3 mm.; met., 5.1 mm.

Length of leg II, 23.2 mm.

Length of leg III, 21.5 mm.

Length of leg IV, 30.1 mm.; tib. + pat., 9.8 mm.; met., 8.3 mm.

Male.—Much lighter in color than the female, but the color patterns are nearly the same. The lighter pubescence is much more abundant on *cephalothorax* than in the female, much predominating over that of blackish color. *Legs* much lighter with the yellow pubescence dense, while the longer black hairs are comparatively sparse; femora with transverse dark bands above, but these indistinct or absent at sides and ventrally; distinct dark rings on tibiae. *Labium* and *endites* sometimes colored as in female but often much lighter, almost yellow. *Coxæ* of legs beneath with black on ventral surface, often reduced to a few spots at distal end, the coxæ being elsewhere yellow. On the *abdomen* also the yellow and brown pubescence predominates over the black, the latter appearing over the black basal band (which is distinct, widest toward posterior end and pointed anteriorly), over the antero-lateral angles and in variously formed spots and streaks laterally, most of the dorsum being thus in life of a golden brown color; venter usually yellow with some spots of black, less often as in the female.

The *chelicerae* clothed on basal half with long golden yellow hairs, distally with black hairs.

Tibia + patella IV longer than the cephalothorax, of same length as the metatarsus; patellæ I and II armed in front and behind.

For structure of palpal organ see Pl. XVII, fig. 8.

Total length, 18 mm. Length of cephalothorax, 9.1 mm.; greatest width, 7.2 mm.

Length of leg I, 30.1 mm.; tib. + pat., 10 mm.; met., 7.4 mm.

Length of leg II, 27.8 mm.

Length of leg III, 26.2 mm.

Length of leg IV, 35 mm.; tib. + pat., 10.5 mm.; met., 10.5 mm.

Syn.—1876. *Tarentula inhonesta* Keyserling, Verh. z. b. Ges. Wien, 26, p. 634, Pl. 7, fig. 17.

1878. *Tarentula tigrina* McCook.

1885. *Lycosa vulpina* Emerton, Tr. Conn. Acad. Sci., 6, p. 487, Pl. 47, fig. 2.

1890. *Tarentula inhonesta*, Marx, Proc. U. S. N. M., 12.

——. *Lycosa vulpina*, Marx, *ibid.*

1890. *Lycosa tigrina*, Stone, Proc. Acad. Nat. Sci. Phila., 42, p. 423.

1892. *Lycosa vulpina*, Banks, *op. cit.*, 44, p. 67, Pl. I, fig. 39.

——. *Lycosa tigrina*, Marx, Proc. Ent. Soc. W., 2, p. 160.

——. *Lycosa tigrina*, Fox, *ibid.*, p. 538.

1898. *Lycosa tigrina*, Simon, Hist. Nat. Araign., 2.

1900. *Lycosa fatifera*, Banks, Proc. Acad. Nat. Sci., Phila., p. 538.

1902. *Lycosa inhonesta*, Montgomery, *op. cit.*, p. 557, Pl. 29, figs. 21, 22.

1904. *Lycosa inhonesta*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 290, Pl. XX, figs. 38, 39.

Type locality.—"North America."

Known localities.—Massachusetts, Rhode Island, New York!, New

Jersey, Pennsylvania, District of Columbia, Alabama, Georgia!, Indiana, Kansas!.

A well-known species of burrowing habits.

Lycosa arenicola Scudder, 1877.

(Psyche, 2, p. 2.)

Female.—Tegument of *cephalothorax* dark reddish brown to blackish, scarcely lighter above; a median lighter band a little wider than third eye row in front, strongly narrowed anteriorly to dorsal groove and usually expanding again back of groove; the band chiefly produced by a finer gray or white pubescence intermixed with coarser brown, the tegument beneath being usually but little lighter than on sides; sides of *cephalothorax* covered with brown pubescence, gray hairs scattered but showing more abundantly below, especially posteriorly. *Chelicerae* dark reddish brown to nearly black, clothed with a dense coat of rusty brown colored pubescence, fringe along furrow of *chelicerae* brighter, reddish or coffee colored. *Labium* and *endites* dark reddish brown, paler distally. *Sternum* dark reddish brown to nearly black. Anterior *coxae* of legs dark brown to nearly black, posterior *coxae* lighter. *Legs* reddish brown, the anterior pairs darker than the posterior; the femora, patellæ and tibiæ of the first and second legs nearly black beneath; distal ends of posterior tarsi and metatarsi usually darker; legs clothed with dense coat of mixed gray and brown pubescence and longer dark brown bristles, *scopulae* brown. *Abdomen* densely pubescent; a dark brown median band on dorsum reaching to the spinnerets behind, which just in front of middle has on each side a broad indentation, and which has behind the middle a series of narrow paired indentations; the band covered or largely formed by dark brown pubescence. Sides of dorsum grayish brown, the pubescence being brown and gray intermixed, the brown more abundant above; a dark brown band of same color as median one crossing each antero-lateral angle and running obliquely backward and downward, meeting the venter back of middle. *Venter* brown to dark brown, usually a darker band from genital furrow to spinnerets. *Epigynum* dark reddish brown. *Spinnerets* brown.

Cephalothorax wide in front; in profile second eyes seem to be lower down on face than usual, highest at third eye row; *pars cephalica* convex; posterior declivity beginning on *pars cephalica* a considerable distance in front of thoracic furrow, making the declivity very long and the posterior portion of *cephalothorax* very low and exaggerating apparent height of front part. *Face* moderate in height, not fully half the

length of the chelicerae, protruding above over base; sides convex, slanting below.

Anterior row of *eyes* almost as wide as second, a little procurved; anterior median eyes larger than the lateral, not fully their radius apart, about as close as to lateral eyes; anterior lateral eyes their diameter from eyes of second row, twice their diameter from front margin of clypeus; eyes of second row their diameter or slightly more than their diameter apart, not fully half as far again from eyes of third row. Quadrangle of posterior eyes hardly one-fifth the length of the cephalothorax.

Lower margin of furrow of *chelicerae* with three equal teeth, the upper margin with three as usual; the smaller teeth above more than usually stout.

Legs distinctly increasing in thickness from the fourth to the first, the first conspicuously stoutest; tarsi and metatarsi I and II densely scopulate; tarsus III with scopula divided by a median setose band; tarsus IV with scopulae much reduced, the scopular hairs being sparse along each side, the setose band occupying most of ventral surface; tibiae I and II and metatarsi I and II armed as usual, the spines of tibiae usually slender and easily rubbed off or overlooked; patellae I and II each armed in front with a spine; tibiae III and IV without true spines above; femora I and II bent forward, IV backward, less so; III nearly straight. Tibia + patella IV shorter than cephalothorax; metatarsus IV much shorter than tibia + patella, but longer than tibia, less than width of cephalothorax.

For structure of epigynum see Pl. XX, fig. 9.

Total length, 20.2 mm. Length of cephalothorax, 10.1 mm.; width, 7.3 mm.

Length of leg I, 23 mm.; tib. + pat., 8.1 mm.; met., 4.9 mm.

Length of leg II, 20.5 mm.

Length of leg III, 19.9 mm.

Length of leg IV, 26.3 mm.; tib. + pat., 9 mm.; met., 6.9 mm.

Syn.—1881. *Tarentula nidifex* Marx, Am. Nat., p. 396.

1885. *Lycosa nidifex* (Marx) Emerton, Trans. Conn. Acad., VI, p. 487, Pl. 47, figs. 4, 4a.

1888. *Lycosa arenicola* Scudder, McCook, Proc. Acad. Nat. Sci. Phila., 1888, p. 333.

1889. *Lycosa arenicola* Scudder, Marx, Araneæ N. A., pp. 561 and 594, note 3d.

1890. *Lycosa arenicola* Scudder, Stone, Proc. Acad. Nat. Sci. Phila.

1892. *Lycosa arenicola* Scudder, Marx, Proc. E. S. W., II, p. 160.

1895. *Lycosa arenicola* Scudder, Banks, J. N. Y. E. S., III, p. 91.

1898. *Lycosa arenicola* Scudder, Simon, Hist. Nat., II, p. 341.

1902. *Lycosa arenicola* Scudder, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 550, Pl. XXIX, fig. 13.
1904. *Geolycosa arenicola*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 299.

Known localities.—Massachusetts, Rhode Island!, Connecticut!, New York (Long Island!), New Jersey, District of Columbia, Pennsylvania, Maryland, Virginia, Indiana.

This species is our best known turret builder. Its burrows are commonly from 10 to 12 inches deep, often one-half inch wide, and are surmounted by turrets usually one and one-half inches in height.

Lycosa fatifera Hentz, 1842.

(Bost. J. N. Hist., IV, p. 229, Pl. 2, fig. 8.)

Female.—*Cephalothorax* with dark red-brown tegument, often blackish about eyes; clothed with tawny colored or rufous pubescence and showing no markings. *Chelicerae* dark reddish brown, with brown or grayish-brown pubescence, rufous distally along furrow. *Labium* and *endites* reddish brown, lighter at tips. *Sternum* and *coxae* of leg beneath light or yellowish brown, clothed with gray pubescence. *Legs* reddish brown; the femora beneath much lighter, yellowish; the tibiae, tarsi and metatarsi commonly much darker, especially in anterior pairs clothed with grayish pubescence; scopulae brown. *Abdomen* above dark brown, clothed with dense brown or tawny pubescence; venter with light, sometimes grayish-brown pubescence. *Spinnerets* brown. *Epigynum* dark reddish brown.

Cephalothorax very wide in front, nearly five-sixths as wide as behind, the sides but little bulging. In profile the cephalothorax is seen to have pars cephalica large and convex; highest between eyes of third row and dorsal groove; posterior declivity long, the median furrow being upon its upper portion. *Face* appearing rather high, but only slightly, if at all, more than half the length of the massive chelicerae; sides convex and slanting as usual. First row of *eyes* as long as second, a little procurved; anterior median eyes more than their radius apart, as far from the anterior lateral eyes which are smaller; anterior lateral eyes more than their diameter from eyes of the second row, more than once and a half their diameter from front margin of clypeus; anterior median eyes their diameter from eyes of second row, or nearly so; eyes of second row their diameter apart; quadrangle of posterior eyes about one-sixth the length of the cephalothorax. *Legs* rather short and stout; the fourth pair two and one-half times the length of the cephalothorax; the second pair twice as long as the cephalothorax; tibia + patella IV shorter than the cephalothorax, same length as tibia +

patella I; metatarsus IV shorter than tibia + patella IV by one-third of its own length; first and second tarsi and metatarsi and distal end of tibiae scopulate; tarsi III and IV with scopulae divided by a median setose band; patella I and III armed in front (within) with a single spine.

The *epigynum* of *Lycosa fatifera* is very much like that of *Lycosa lenta*, but is smaller, being not more than half as long, also the septal piece of the guide in *lenta* is more than two and one-fourth times as long as the cross-piece, whereas it is less than twice as long in *fatifera*; the cross-piece is also somewhat differently shaped in the two (Pl. XX, fig. 8.)

Total length, 17.5 mm. Length of cephalothorax, 9.3 mm.; width, 6.5 mm.

Length of leg I, 20.5 mm.; tib. + pat., 8 mm.; met., 4.4 mm.

Length of leg II, 18.7 mm.

Length of leg III, 16.4 mm.

Length of leg IV, 23.5 mm.; tib. + pat., 8 mm.; met., 6.1 mm.

Type locality.—Alabama.

Known localities.—Alabama!, Georgia!, Texas, Missouri!, Kansas!, Illinois, Utah!.

Syn.—1832. *Lycosa fatifera* Sill, J. Sc. and Arts (ad. part.), pp. 106–107.

1875. *Lycosa fatifera* Hentz, Spiders of U. S. (Burgess), p. 26, Pl. 2, fig. 8.

1895. *Lycosa missouriensis* Banks, Ent. News., Vol. IV, p. 206.

1899. *Lycosa domifex* Hancock, Ent. News, Vol. X, p. 26.

1904. *Geolycosa latifrons* Montgomery, Proc. Acad. Nat. Sci., Phila., p. 295, Pl. XIX, figs. 15–18.

It seems very probable that Hentz, in his notes on habits, has confounded two species under the name *fatifera*; but the description and the figure which he gives can hardly be applicable to any other species than the one under consideration. The description and figure indicate a form without distinct markings, and his statement that a “piceous variety is found in Alabama, with the two first joints of the legs pectus and abdomen yellowish underneath, or lighter in color,” applies perfectly to some specimens of the form above described which I have from this same locality, and which is very common there and must have been well known to Hentz. This form fits only his description of *fatifera* among all treated by him. The species which Hentz observed living in holes in Massachusetts, and which he says is common there, may have been *L. aspersa* (*inhonesta*), as has been suggested by Banks, but far more likely it was *arenicola*, the common turret builder of that region. Hentz says: “Cheliceres covered with rufous hairs,” which is not so in most specimens of *aspersa*. The strong markings of *aspersa*

would not have been passed over. However, Hentz would seem to have written his description after he had been in the South and away from Massachusetts for many years, and doubtless had before him only the Southern form, which he erroneously supposed to be the same as the turret builder he recalled as common in Massachusetts. Old and rubbed specimens of *arenicola* might appear similar, as the markings in this form are due to color of the hair. Whatever Northern form it was the habits of which Hentz had in mind, it was long ago separated under another name, and this common and widespread Southern form which Hentz undoubtedly described as and called *fatifera* must logically continue to bear this name.

The species has been found abundant in the "sandy waters bordering the lower end of Lake Michigan" by Mr. J. C. Hancock ('99) who says: "Patches of high grass, sedges and ragweeds made the open lay of ground a paradise of running spiders. Here it was the castle-building species [termed by him *domifex*] seemed perfectly at home, showing its varied accomplishments to best advantage. The artfully-hidden castle is not apparent to the uninitiated while walking over the ground, as it is commonly secreted in a recess of overhanging dried grass. When one remembers the average size of the adult castle, only five-eighths of an inch high and a little over one-half inch in diameter, it is obvious that close inspection is quite essential. Usually the spider's tube is constructed vertically in the ground, unless obstructions cause some deviations. Old spiders live in their burrows for more than a season and often remodel them after being injured by storms. Younger specimens re-dig outgrown burrows, enlarging them as occasion requires. Materials used in the construction of the turrets were green and dried grass leaves, dried fine sedges, leaves of foxtail grass, fibrous roots, etc. Young specimens not infrequently build a perfect little tower, almost entirely of stones, and one I have in mind had nine such particles made into a compact edifice five millimeters high. The masonry was exquisitely put up, every stone bearing out true proportions about the central opening of four millimeters diameter. Silk used as cement held the whole together securely."

The author has found the burrows of this species abundant over grassy stretches on the foothills near Salt Lake City. In the case of some burrows no turrets are present; but in most cases turrets of dried sticks, grass or earth are found.

***Lycosa lenta* Hentz, 1844.**

(J. Bost. Nat. Hist., IV, p. 386.)

Female.—Tegument of *cephalothorax* reddish brown as usual, lighter

brown in a median band which may be very indistinct anteriorly, also lighter along margins, with radiating light lines connecting middle and side bands; clothed principally with light gray pubescence, which is densest in a rather wide marginal band each side and in a middle band, widening from eyes until as wide as eye area at point between eyes and dorsal groove and then suddenly narrowed to only about half as wide, and from there very gradually narrowing caudad; the median band and lateral band of gray on each side connected by radiating lines of same color; on the sides a dark brown pubescence intermixed with the line of gray and more abundant above, below the median gray band. *Chelicerae* black, the lateral condyles red, clothed with a dense light gray or yellowish gray pubescence. *Labium* and *endites* black or dark brown-black, lighter distally. *Sternum* and *coxae* of legs beneath black or dark brown-black, clothed with gray and longer, stiffer dark brown or blackish pubescence. *Legs* brown to yellowish, clothed with light gray to brown-gray pubescence; *scapulæ* brown; legs without rings or markings above. *Abdomen* gray-brown from gray and brown pubescence intermixed, usually in fine streaks and dots; a lanceolate outline or more rarely solid mark at base which is truncated or bifurcated behind; on posterior half a few more indistinct chevron-marks, each bordered behind by a light line, ending in a light spot each side; a row of triangular dark spots on each side behind but connected by the light cross-lines. Sides of abdomen light gray, immaculate or with a few spots of brown. Venter in front of lung-slits brown or gray, often black along the middle; behind lung-slits solid black or sometimes with a light central spot surrounded with black. *Spinnerets* brown. *Epigynum* dark reddish brown.

Cephalothorax high, highest a little behind third eye row, line of dorsum a little convex; dorsal groove partly above and partly on posterior declivity. *Face* hardly above half the length of the long and massive *chelicerae*, the sides convex and slanting about as usual.

Anterior row of *eyes* a little shorter than the second, nearly straight; anterior median eyes distinctly larger than the lateral (3 : 2), less than their radius apart and about the same distance from the lateral; anterior lateral eyes a little more than their diameter from front margin of clypeus, scarcely closer to eyes of second row; anterior median eyes less than their diameter from eyes of second row; eyes of second row less than three-fourths their diameter apart; quadrangle of posterior eyes not fully one-fifth the length of the cephalothorax.

Legs moderately long and stout; the posterior tarsi rather slender; tibia + patella IV shorter than cephalothorax; patella I and II armed

in front with a spine; tibiae and metatarsi I and II armed below as usual, the spines small and weak; tarsi and metatarsi I and II scopulate as usual; the scopulae of tarsi III and IV divided by rather narrow median setose bands.

For structure of *epigynum* see Pl. XVIII, fig. 8.

Total length, 22 mm. Length of cephalothorax, 11 mm.; width, 7.8 mm.

Length of leg I, 28.1 mm.; tib. + pat., 10 mm.; met., 6 mm.

Length of leg II, 25.4 mm.

Length of leg III, 25 mm.

Length of leg IV, 32.1 mm.; tib. + pat., 10 mm.; met., 9.2 mm.

Male.—Coloration nearly as in female.

Chelicerae above with light yellow-gray pubescence; pubescence on distal portion dark, but fringe along furrow light gray.

Patella I and II armed both in front and behind; spines on tibiae and metatarsi I and II comparatively long, not reduced as in female. Patella and tibia about equal in length and stoutness, together as long as the tarsus which is distinctly thicker.

For structure of *palpal organ* see Pl. XVIII, fig. 8.

Total length, 20.5 mm. Length of cephalothorax, 10.5 mm.; width, 8 mm.

Length of leg I, 35.7 mm.; tib. + pat., 12.2 mm.; met., 8.8 mm.

Length of leg II, 33 mm.

Length of leg III, 30.4 mm.

Length of leg IV, 40 mm.; tib. + pat., 12.5 mm.; met., 11.6 mm.

Syn.—1844. *Lycosa ruricola* Hentz, J. Bost. Nat. Hist., p. 387.

1875. *Lycosa lenta* Hentz, Sp. of U. S., p. 27, Pl. 3, figs. 1, 2, 3, 4.

——. *Lycosa ruricola* Hentz, *ibid.*, p. 28, Pl. 3, figs. 5, 6.

1890. *Lycosa lenta*, Marx, Proc. U. S. N. M., 12.

1892. *Lycosa ruricola* Hentz, Marx, Proc. Ent. Soc. W., II, p. 160.

1898. *Lycosa lenta* Hentz, Simon, Hist. Nat. des. Araign, II, p. 333.

1900. *Lycosa lenta* Hentz, Banks, Proc. Acad. Nat. Sci. Phila., p. 538.

Locality.—Pennsylvania, North and South Carolina.

Known localities.—Pennsylvania, North Carolina!, South Carolina, Alabama!, Georgia, Florida.

It would seem probable that Hentz did not in all cases distinguish this form from his *erratica*, and that his account applies partly to the latter species. What he regarded as the typical form, however, was a burrow-making species, although, like *carolinensis*, etc., found wandering about and hiding under stones, for in his discussions of *erratica* he says: "This species I formerly supposed to be a variety of *L. lenta*, but it was always found wandering and never in holes. I therefore

consider it as perfectly distinct, having been often seen running in the grass." Concerning *lenta* he remarks: "This common and powerful species is found wandering in fields, attacking and subduing very large insects. The female carries her young on her back, which gives her a horrible appearance. If caught or wounded the little ones escape rapidly in all directions; but the mother is faithful to her duties and defends her progeny while life endures. It hides under stones, logs, etc."

Var. **baltimoriana** (Keyserling), 1876.

(Sub *Tarentula*, Verh. z. b. Ges. Wien, 26, p. 632.)

Patellæ and distal ends of tibiæ black beneath; femora of the first and second legs with a dark line along posterior side and one or two similar ones above, these replaced with corresponding rows of dots on posterior femora. Otherwise agreeing with type form.

Syn.—1890. *Tarentula baltimoriana*, Marx, Proc. U. S. N. M., 12, p. 563.

1902. *Lycosa baltimoriana*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 561, Pl. 29, fig. 25.

1904. *Lycosa baltimoriana*, Banks, J. N. Y. Ent. Soc., XII, p. 114.

———. *Geolycosa baltimoriana*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 297.

Type locality.—Baltimore, Md.

Known localities.—Rhode Island, Pennsylvania, Maryland, District of Columbia, Virginia, Texas.

I have seen too few specimens of this form to be able to determine satisfactorily the validity of its rank as a variety. It is maintained here as such tentatively. Females showing the variant colors are not known to me personally, nor have such been reported.

Lycosa carolinensis Walckenaer, 1837.

(Insect. Apt., p. 285).

Female.—Tegument of *cephalothorax* uniformly dark reddish brown covered with a dense coat of brown and gray hair making it more or less mouse-colored, showing in fully grown individuals commonly no distinct markings; in some a gray supramarginal band on each side and a similar median one along the dorsum, widening from behind anteriorly. *Chelicerae* black, covered with a coat of orange-yellow hairs with more sparse long brown bristles; the dense fringe along furrow reddish brown or rust colored. *Labium* and *endites* black, brown at tips. *Sternum* and *coxae* of legs beneath black, covered with brown hairs. Tegument of *legs* reddish brown, darker distally, paler on ventral surface of femora; on ventral surface at distal end of femur and at

both ends of tibia black, these dark bands covered with dark brown hair; the scopulæ of same brown color, but legs elsewhere clothed with much lighter hair which is light brownish gray to whitish. *Abdomen* with the tegument light brown; at base a dark or blackish median stripe which bifurcates at its caudal end and sends out from its sides several pairs of pointed lines directed caudo-laterally; behind the basal stripe a series of chevron-shaped laterally and anteriorly acutely pointed dark cross-marks, often a series of light dots along each side; dorsum densely covered above with long brown to grayish-brown pubescence, except over the dark marks which are clothed and made more distinct by black hair; sides of abdomen above dark with brown and black pubescence intermixed in spots and streaks, the sides below becoming paler, yellow to gray or almost white with larger but more sparse black spots; venter nearly always deep brown or black, due largely to the pubescence being very dense and of the latter color; sometimes a light mark or spot within the light area on each side of middle line, leaving three black stripes converging and uniting in front of the spinnerets and united by a cross-bar behind the genital furrow, while in other rarer cases the reduction of the black may be carried even farther. *Spinnerets* brown. *Epigynum* reddish black.

Face in height moderate, more than half the length of the chelicerae; sides strongly convex and moderately slanting outward below, not so steep as in *scutulata*.

Anterior row of *eyes* nearly as long as the second, but little procurved; anterior median eyes not fully their radius apart, a little farther from the lateral eyes which are a little smaller; clypeus wide, the anterior lateral eyes more than one and one-half times their diameter, or rather nearer twice from its front margin, closer to eyes of second row; eyes of second row not proportionately large, not much less than their diameter apart; eyes of third row twice as far apart as from those of second row; quadrangle of posterior eyes relatively short, being not fully one-sixth the length of the cephalothorax.

Chelicerae long and very robust, the margins of its furrows armed in typical manner. *Labium* a little longer than wide (12.5 : 11.75); basal excavation one-third or a little more the total length; labium above excavations broadly rectangular, as wide above as below, the sides nearly parallel and scarcely curved, antero-lateral angles rounded; front margin widely truncate. *Legs* long and robust; tibia + patella IV shorter than the cephalothorax, of same length or nearly so as tibia + patella I; spines of anterior tibiae beneath as usual; patella I and II each armed on the anterior side with a single spine; anterior tarsi

and metatarsi beneath with dense scopular pads which extend also over tibiae except at basal third or half; scopulae of posterior legs not extending upon tibiae, divided as usual.

Epigynum oblong, rounded anteriorly; guide inversely T-shaped with the transverse arm shorter and stouter; lateral furrows narrow and of same width throughout. (Pl. XXI, fig. 1.)

Total length, 34.5 mm. Length of cephalothorax, 14 mm.; width, 11 mm.

Length of leg I, 38.7 mm.; tib. + pat., 13.2 mm.; met., 8 mm.

Length of leg II, 35 mm.

Length of leg III, 31.7 mm.

Length of leg IV, 42 mm.; tib. + pat., 13.2 mm.; met., 10.8 mm.

Male.—Rather lighter in color than the female. *Chelicerae* very densely covered with grayish-yellow hair, the heavy fringe of the furrow rufous.

Patellae of legs I and II armed both in front and behind.

Patella and tibia of *palpus* of nearly same length and thickness, the tibia enlarging distally; tarsus a little shorter than the two preceding joints together. For structure of tarsal organ see Pl. XXI, fig. 2.

Total length, 21 mm. Length of cephalothorax, 11.1 mm.; width 8.6 mm.

Length of leg I, 35.7 mm.; tib. + pat., 12.2 mm.; met., 8.3 mm.

Length of leg II, 32.3 mm.

Length of leg III, 28.7 mm.

Length of leg IV, 40.2 mm.; tib. + pat., 12.3 mm.; met., 11.5 mm.

Syn.—1842. *Lycosa carolinensis*?, Bosc MSS., Hentz, J. B. Soc. N. H., 4, p. 230.

1852. *Lycosa pilosa* Girard, Marcy's Expl. Red R. of La., p. 252, Pl. 16, figs. 4 and 5.

1875. *Lycosa carolinensis*?, Bosc MSS., Hentz, Sp. of U. S., p. 27, Pl. 2, fig. 9.

1885. *Lycosa carolinensis* Hentz, Emerton, Tr. Conn. Acad. Sci., 6, p. 486, Pl. 47, figs. 1 to 1b.

1890. *Lycosa carolinensis*, Marx, Proc. U. S. N. M., 12, p. 561.

— *Lycosa carolinensis*, Stone, Proc. Acad. Nat. Sci. Phila., 42, p. 423.

1892. *Lycosa carolinensis*, Marx, Proc. Ent. Soc. W., 2, p. 160.

— *Lycosa carolinensis*, Fox, Proc. Ent. Soc. W., 2, p. 269.

1894. *Lycosa carolinensis*, Banks, J. N. Y. Ent. Soc., 2, p. 50.

1895. *Lycosa carolinensis*, Banks, Ann. N. Y. Acad. Sci., 8, p. 429.

— *Lycosa carolinensis*, Banks, Ent. News, 6, p. 205.

1896. *Lycosa carolinensis*, Banks, J. N. Y. E. Soc., 4, p. 192.

1898. *Lycosa carolinensis*, Simon, Hist. Nat. Araign., 2, pp. 332 and 347.

1900. *Lycosa carolinensis*, Banks, Proc. Acad. Nat. Sci. Phila., p. 538.

1902. *Lycosa carolinensis*, Banks, Proc. Acad. Nat. Sci., Phila. p. 586.

1902. *Lycosa carolinensis*, Emerton, Common Sp. U. S., p. 73, fig. 176.

— *Lycosa carolinensis*, Montgomery, Proc. Acad. Nat. Sci. Phila., 556.

1904. *Geolycosa texana* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 293, Pl. XVIII, figs. 13, 14 (color var.).

— *Geolycosa carolinensis*, Montgomery, *ibid.*, p. 299.

Type locality.—"Carolina."

Known localities.—New Hampshire!, Massachusetts, Rhode Island!, Connecticut, New York!, New Jersey, Pennsylvania, District of Columbia!, North Carolina!, Georgia, Alabama, Florida, Louisiana, Mississippi!, Texas!, Kansas!, Indiana, Colorado, Utah!.

Our largest *Lycosa*, much resembling in its large size and in coloration the famous *Tarentula* of southern Europe and its close allies. Specimens from the Southwest often differ from the typical form in having the venter in part pale as above described.

"This spider has the same habits as *L. fatifera*, making deep excavations in the ground. It is frequently found under stones, and possibly it is in such places, nearer the surface, that the eggs are hatched. The female carries her young on her back, presenting a hideous aspect, being then apparently covered with animated warts. The little monsters have the instinct, if the mother is much disturbed, to escape and scatter in all directions. The male, not unfrequently of an enormous size, is often found wandering in October and November in Alabama, and sometimes enters houses" (Hentz). Concerning its habits in New England, Emerton says: "This species digs a hole six or eight inches deep, but is often found under stones or running in fields and occasionally in houses all over New England."

This species is common in Utah, where the males are frequently seen wandering in the open or hiding under stones. The females dig deep burrows which are sometimes surmounted with turrets, but not so commonly so as in the case of *fatifera*.

***Lycosa coloradensis* Banks, 1894.**

(J. N. Y. Ent. Soc., p. 50.)

Female.—Tegument of *cephalothorax* reddish brown, densely clothed with pubescence which nearly completely masks the ground color. A median light band as wide anteriorly as the eye area, but abruptly narrowed at dorsal groove to only half that width or less; this median band formed of brown-gray pubescence, often mixed anteriorly with darker pubescence which obscures the distinctness of the band. Sides of *cephalothorax* clothed with dark, brownish to grayish black pubescence, mixed with gray like that of median band, the gray predominating, principally arranged in wide radiating bands and becoming more abundant below, where it forms on each side a marginal band which is widest anteriorly where it nearly touches eye area. *Chelicerae* with tegument blackish or reddish black, completely masked on upper half with dense pubescence of rusty brown color, that of lower half dark and very sparse, paler

along furrow of *chelicerae*. *Labium* and *endites* black or nearly so, lighter at tips. *Sternum* and *coxae* of legs beneath black or nearly so. *Femora* of legs beneath light gray, the *tibiae* and more especially the *tarsi* and *metatarsi* darker brown because of *scopulae*, the ends of *femora* and of last four *tibiae* black; above the *femora* a little darker than below, brown, but distal joints no darker, no bands at end of any joints showing above. *Legs* densely clothed with pubescence which give the colors as above, the tegument itself being reddish brown above and much paler, yellowish, beneath except at ends of *femora* and last two pairs of *tibiae* which are black. *Abdomen* with middle of *dorsum* light brown or grayish brown, a dark brown basal lanceolate mark with its margins deeper, its points behind terminating in the apex of a dark chevron-mark, which is followed behind by several other chevrons. The lanceolate mark giving off laterally most commonly two pairs of lines running latero-caudally on each side; side of *dorsum* dark brown or blackish with numerous small light dots and enclosing on each side a series of large light spots along sides of chevrons, and at outer ends of the lines from basal mark an ocellate light spot contiguous with each side of basal spear-mark near its middle. Upper portion of sides dark brown to black with numerous light spots and darker, below the sides are gray with dark brown or black spots. Venter in front of lung-slits and in a smaller spot at base of *spinnerets* black, elsewhere gray, with or without small dots of black. *Spinnerets* dark brown. *Epigynum* black or reddish black.

Cephalothorax behind rather low; in profile highest at third eye row or a little behind it, a little depressed or notched at dorsal groove. *Face* low, one-half in height the length of the *chelicerae*.

Front row of *eyes* shorter than second; eyes of first row very nearly equal in size; eyes of second row three-fourths their diameter apart; anterior lateral eyes their diameter from eyes of second row, closer still to front margin of clypeus; quadrangle of posterior eyes one-fifth the length of the *cephalothorax*.

Leg IV less than three times the length of the *cephalothorax*; *tibia* + *patella* IV shorter than *cephalothorax*, longer than *metatarsus*; *metatarsus* IV nearly of same length *tib.* + *pat.* I; *metatarsi* and *tarsi* I and II *scopulate*; *tarsi* III and IV with wide setose bands dividing *scopulae*. *Tibiae* I and II armed as usual. *Patella* II armed in front with a single spine.

For structure of *epigynum* see Pl. XVIII, fig. 6.

Total length, 18 mm. Length of *cephalothorax*, 8 mm.; width, 6 mm.

Length of leg I, 18.4 mm.; tib. + pat., 5.9 mm.; met., 4 mm.

Length of leg II, 17.8 mm.

Length of leg III, 17.3 mm.

Length of leg IV, 22.5 mm.; tib. + pat., 7.2 mm.; met., 6 mm.

Male.—*Coloration* similar to female; pattern on abdomen rather more distinct and spots on sides fewer.

Patella I and II armed both in front and behind. Tibia and patella of palpus subequal in length and thickness, together as long as tarsus; tarsus much thicker than preceding joints.

For structure of palpal organ see Pl. XVIII, fig. 7.

Total length, 13.3 mm. Length of cephalothorax, 6.7 mm.; width, 5 mm.

Length of leg I, 23.6 mm.; tib. + pat., 8.1 mm.; met., 5.9 mm.

Length of leg II, 21.8 mm.

Length of leg III, 19.3 mm.

Length of leg IV, 26.3 mm.; tib. + pat., 8.1 mm.; met., 7.6 mm.

Type locality.—Colorado.

Known localities.—Colorado!, Arizona!, New Mexico, Kansas!.

***Lycosa erratica* Hentz, 1842.**

(Journ. Bost. Soc. Nat. Hist., 4, p. 388.)

Female.—Sides of *cephalothorax* blackish brown, less commonly paler; a reddish yellow or reddish brown median band, narrowest behind, which widens distinctly at posterior end of *pars cephalica* and becomes as wide as third eye row, from which point it contracts to a narrow stripe or line which continues forward to the first eye row; along each lateral margin a light band similarly colored to the median one, the lateral bands bisected by a dark line at least anteriorly; the median pale band clothed with light gray or brownish-white pubescence which between the eyes becomes yellowish, the lateral bands similarly clothed; sides of cephalothorax clothed with similar hair intermixed with much black which is most abundant along each side of the median band, but becomes more and more sparse below toward the margins. *Chelicerae* dark reddish brown, clothed with short yellowish pubescence and with intermixed longer black bristles, a fringe of long dark gray hair along the margin of furrow. *Labium* and *endites* reddish brown. *Sternum* blackish, with usually a paler median stripe; clothed with grayish brown and more scattered blackish hairs. *Legs* and *palpi* brown covered with a short brownish gray pubescence with the usual longer blackish hairs intermixed; all femora with dark cross-bands or annulations which are present also at the ends and in the middle of the tarsi

and metatarsi and at the middle of the patellæ of the posterior pairs, but which are not present on these joints of the anterior pairs; the dark annuli on the femora mostly incomplete below; the anterior and posterior face of each femur commonly with a longitudinal black line or stripe. *Abdomen* with a wide pale band over the dorsum, narrowing usually to a point at the spinnerets; within the pale band at base a dark, black-edged, lanceolate mark which extends to or often much beyond the middle, ending usually in a forked apex and followed behind usually by a triangular mark and several dark cross-lines; at other times the basal stripe ends acutely; less commonly it is entirely absent; sides of dorsum laterad of light band dark brown enclosing a series of large angular black spots; sides above brown becoming lighter below, usually marked with numerous small black spots; venter whitish or light yellow, without spots, but in the great majority of cases marked by a black U-shaped stripe, each arm of which has its end behind a lung-slit, the bent middle part being at the spinnerets, the arm of the U-shaped band often connected by a cross-band behind the genital furrow; sometimes the venter is entirely pale without any markings. *Epigynum* reddish brown. *Spinnerets* smoky brown to black.

Face moderate in height, the chelicerae about one and three-fourths times as long; sides convex and moderately divergent below. Anterior row of *eyes* moderately procurved, shorter than the second by twice the diameter of a lateral eye; anterior median eyes their radius apart, closer to the smaller lateral eyes; anterior lateral eyes their diameter from eyes of second row, a little farther from margin of clypeus; eyes of second row their diameter apart, not much farther from the three-fourths as large eyes of the third row; eyes of third row twice as far from each other as from eyes of second row; cephalothorax rather less than five times the length of the cephalothorax. *Chelicerae* armed as usual, the third tooth of lower margin of furrow a little reduced. *Labium* much longer than wide (16 : 12.5); basal excavation of usual length; sides evenly convexly curved from excavations to anterior angles; front margin truncate. *Legs* long, the distal joints slender, especially so the posterior metatarsi; tibia + patella IV longer than cephalothorax which is longer than tibia + patella I; anterior tibiae with spines as usual; scopulae of tarsi as usual, those of anterior pairs extending also upon metatarsi except at base; patella II armed within.

Ends of transverse arms of guide of *epigynum* almost always characteristically excavated on anterior side of ends (Pl. XVII, fig. 3).

Total length, 14 mm. Length of cephalothorax, 5.4 mm.; width, 4 mm.

Length of leg I, 14.6 mm.; tib. + pat., 5 mm.; met., 2.9 mm.

Length of leg II, 13.9 mm.

Length of leg III, 13.2 mm.

Length of leg IV, 19.3 mm.; tib. + pat., 5.9 mm.; met., 4.9 mm.

Male.—Coloration as in female but rather brighter.

For structure of palpal organ see Pl. XVII, fig. 4.

Syn.—1844. *Lycosa sagittata* Hentz.

1846. *Lycosa propinqua* Blackwall, 1846 (Ann. and Mag. Nat. Hist., Vol. XVII, pp. 31, 32).

1875. *Lycosa erratica* Hentz, Sp. U. S. (Burgess), p. 29, Pl. 3, fig. 8.

1876. *Tarentula lepida* Keyserling, Verh. z. b. Ges. Wien, 26, p. 631, Pl. 7, fig. 15.

1877. *Tarentula scalaris*, Thorell, Bull. U. S. Geol. Surv. Terr., III, No. 2, p. 520.

1885. *Lycosa communis* Emerton, Trans. Conn. Acad. Sci., 6, p. 489.

1890. *Lycosa erratica*, Marx, Proc. U. S. N. M., 12, p. 561.

——. *Lycosa communis*, Marx, loc. cit.

——. *Lycosa communis*, Stone, Proc. Acad. Nat. Sci. Phila., 42, p. 426.

1891. *Lycosa erratica*, Banks, Ent. News, 2, p. 86.

1892. *Lycosa communis*, Marx, Proc. Ent. Soc. W., 2, p. 160.

——. *Lycosa communis*, Banks, Proc. Acad. Nat. Sci. Phila., 44, p. 64.

——. *Lycosa communis*, Fox, Proc. Ent. Soc. W., 2, p. 269.

1895. *Lycosa erratica*, Banks, J. N. Y. Ent. Soc., Vol. 3, p. 91.

——. *Lycosa erratica*, Banks, Ent. News, 6, p. 205.

1898. *Lycosa erratica*, Simon, Hist. Nat. Araign., 2, p. 331.

1900. *Lycosa erratica*, Banks, Proc. Acad. Nat. Sci. Phila., p. 538.

1902. *Lycosa communis*, Emerton, Common Sp. of U. S., p. 75, figs. 181, 182.

——. *Lycosa lepida*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 562, Pl. 29, figs. 26, 27.

1904. *Lycosa lepida*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 287.

Type locality.—Massachusetts and Alabama.

Known localities.—Massachusetts!, Connecticut, Rhode Island!, New Hampshire!, New York!, Pennsylvania, New Jersey, District of Columbia!, Alabama, Louisiana!, Texas, Georgia!, North Carolina!, Ohio, Illinois, Iowa!, Kansas!, Colorado!, Arizona!, Utah!, Montana!.

I do not think there is room for doubt that the species above described is the real *erratica* of Hentz, when one considers the abdominal markings shown in his figure, in connection with his comments on habits and the localities where he found it common.

Hentz says concerning this species that it "was always found wandering and never in holes; . . . it was often seen, generally running in the grass." This is a very common and widely distributed species, found under stones and logs in the woods and especially in grassy meadows. It is subject to much variation in size, though its characteristic markings are rarely missed.

Lycosa scutulata Hentz, 1842.

(Journ. Bost. Soc. Nat. Hist., IV, p. 390.)

Female.—*Cephalothorax* with a dark chocolate-colored band each

side of the middle line which is widest behind and narrowing forward is prolonged over the eyes of the corresponding side to the front margin of the clypeus, and in young specimens continues down the chelicerae of the same side to near its distal end; these bands are covered with a blackish pubescence with intermixed lighter yellowish hairs; between these dark bands is a narrower yellowish-brown median band which is much constricted between the last two rows of eyes, but expands again upon the face before reaching the margin of clypeus, this band clothed with yellowish-gray pubescence, clear yellow in front; the sides of cephalothorax below dark bands colored and clothed similarly to median band with below a chocolate-colored submarginal line. *Chelicerae* reddish brown covered with yellowish or grayish-yellow pubescence at the distal end, within along the femora a fringe of longer hair of somewhat rusty tinge. *Labium* reddish brown, clothed with a grayish or tawny pubescence with intermixed longer, stiffer black hair. *Sternum*, *endites* and *coxae* of legs beneath light brown. *Legs* and *palpi* light brown, the tarsi and metatarsi mostly darker, as also the tibiae at distal ends; the femora with some rather faint longitudinal darker lines clothed with tawny pubescence with intermixed hair of blackish color, the longer ones of the latter pale on distal halves. *Abdomen* with a broad blackish median band extending the entire length narrowed from near middle towards each end, this band covered with intermixed dark brown and blackish pubescence, the band indented with a brownish-yellow notch on each side in front of middle and behind either with a series of similar indentations of yellow or enclosing corresponding pairs of submarginal spots; each side of median band a narrow brownish band appearing yellow because covered by a dense coat of yellowish pubescence; sides with tegument brown, sheathed with lines of blackish-brown and yellowish pubescence above, paler yellow with black spots below. Tegument of venter brown, densely clothed with yellow pubescence and with small spots of black pubescence, mostly arranged over one or two pairs of darker lines converging toward the spinnerets. *Spinnerets* rather dark brown. *Epigynum* blackish.

Smaller specimens are paler, and the venter may be without spots and unmarked except for faint indications of the posteriorly converging lines.

Cephalothorax highest at third row of eyes, dorsal line in profile a little depressed at front of median groove. *Face* high, two-thirds as high as chelicerae are long, in profile slightly convex and protrudes a little above. Anterior row of *eyes* procurved, shorter than the second

by twice their diameter; eyes subequal in size and nearly equidistant, being separated from each other by a space rather less than their radius; anterior lateral eyes more than their diameter from the front margin of clypeus, closer to the eyes of second row; eyes of second row large, less than their diameter apart; eyes of third row two-thirds as large as those of the second, nearly twice as far from each other as from eyes of second row; cephalothorax five times as long as quadrangle of posterior eyes. Margins of furrow of the chelicerae armed as usual, the third tooth of the lower margin a little reduced. *Labium* much longer than wide (19 : 16); basal excavation one-third the total length or rather longer; sides below straight and subparallel to middle, then straight and converging to angles in front; front margin very gently convex laterally and indented at middle. *Legs* long and slender; the posterior tarsi slender and nearly as long as tibia + patella; all tarsi densely scopulate, the scopulae clearly divided on posterior pairs by a narrow median setose band, on the anterior pairs the scopulae extend also upon the metatarsi entirely to the base and even upon the tibiae distally.

For structure of *epigynum* see Pl. XVII, fig. 9.

Total length, 21.5 mm. Length of cephalothorax, 10 mm.; width, 7.6 mm.

Length of leg I, 32.6 mm.; tib. + pat., 10.8 mm.; met., 7.8 mm.

Length of leg II, 28.4 mm.

Length of leg III, 21.7 mm.

Length of leg IV, 38.8 mm.; tib. + pat., 12.2 mm.; met., 11.8 mm.

Male.—Front pair of *legs* dark reddish brown to black, excepting tarsus and proximal end of femur, above which are lighter; other legs light brown. Anterior half of median dorsal stripe of abdomen black and distinctly darker than posterior half. *Venter* gray, immaculate. *Chelicerae* brown with yellow pubescence.

Patella I and II armed in front and behind.

For structure of palpus see Pl. XVIII, fig. 1.

Total length, 11 mm. Length of cephalothorax, 6 mm.; width, 4.7 mm.

Length of leg I, 21.6 mm.; tib. + pat., 7.2 mm.; met., 5.6 mm.

Length of leg II, 20.5 mm.

Length of leg III, 17.8 mm.

Length of leg IV, 25.8 mm.; tib. + pat., 7.7 mm.; met., 8.1 mm.

Syn.—1875. *Lycosa scutulata*.

1875. *Lycosa scutulata*.

1890. *Lycosa scutulata* Marx, Proc. U. S. N. M., XII, p. 563.

1890. *Lycosa scutulata* Hentz, Stone, Proc. Acad. Nat. Sci. Phila., p. 427.
 1892. *Lycosa scutulata* Hentz, Banks, Proc. Acad. Nat. Sci. Phila., 1892, p. 66.
 ——. *Lycosa scutulata* Marx, Hentz, Proc. Ent. Soc. Wash., II, p. 160.
 1895. *Lycosa scutulata* Hentz, Banks, J. N. Y. Ent. Soc., Vol. III, p. 91.
 ——. *Lycosa scutulata* Hentz, Banks, Ent. News, IV, p. 205.
 1897. *Lycosa scutulata* Hentz, Banks, Proc. Ent. Soc. Wash., Vol. IV, p. 189.
 1898. *Lycosa scutulata* Hentz, Banks, Proc. Col. Acad. Sci., 3d ser., Zool., Vol. I, p. 268.
 ——. *Lycosa scutulata* Hentz, Simon, Hist. Nat. Araign., Vol. II, pp. 329, 330, 346.
 1900. *Lycosa scutulata* Hentz, Banks, Proc. Acad. Nat. Sci. Phila., p. 538.
 1902. *Lycosa scutulata* Hentz, Emerton, Common Sp. of U. S., p. 76.
 ——. *Lycosa scutulata* Hentz, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 553.
 1904. *Lycosa scutulata* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 289.

Type location.—Alabama.

Known localities.—Alabama, North Carolina!, Georgia!, Florida, Louisiana!, Mississippi, Texas, Connecticut, New York!, Pennsylvania, New Jersey, District of Columbia, Ohio, Indiana!, Illinois, Iowa!, Kansas!.

Hentz remarks as follows concerning *Lycosa scutulata* after his original description: "This common and very distinct species attains a very large stature. It is most commonly found wandering in quest of prey. . . . The cocoon is very large, spherical and whitish, containing from 150 to 200 eggs, which hatch before the cocoon is opened. The yellow spots on the abdomen seem to be wanting in the young" (*Sp. U. S.*, p. 32).

Lycosa punctulata Hentz, 1842.

(J. Bost. Soc. N. Hist., 4, p. 390.)

Cephalothorax light brown, with each side of the middle a blackish-brown stripe which runs forward over eyes of the corresponding side and reaches the front margin of the clypeus as a much narrower line, also on each side a very narrow marginal and a wider submarginal blackish line; the median light band is narrower than the dark bands enclosing it; between the eyes of the third and second row it is narrowed to a line but widens again above eyes of first row; the dark bands of cephalothorax are clothed with dark somewhat smoky-brown pubescence, the light regions covered with a grayish-brown pubescence about the eyes are longer. *Chelicerae* black, clothed with short light yellowish pubescence and some mostly very long blackish bristles; at the distal end within along the furrow a fringe of long yellow or rusty yellow hairs. *Labium* and *endites* dark reddish brown; light distally. *Sternum* black, clothed with grayish-brown pubescence. *Coxae* dark reddish brown. *Legs* elsewhere brown; the distal ends of

the tibiæ and metatarsi of the last legs usually darker, legs otherwise without markings; covered with a very stout pale pubescence and with longer straight blackish bristles which are denser than in *scutulata*; the longer bristles appear paler distally as in *scutulata*. Tegument in general brown, blackish brown along a wide median band extending the entire length of the *abdomen*, the band widest in middle, covered by intermixed black and deep brown pubescence with longer black bristles; margin of middle black band smooth, not broken by indentations or enclosed lighter spots; the black pubescence more dense at borders of its median band, the brown over its middle; each side of middle band a grayish-brown stripe; exterior to gray stripes the sides are colored with brown and grayish brown intermingled in spots and streaks, the brown often solid at the antero-lateral angles; sides below and the venter gray with very small spots of black, the venter with a variable number of larger black spots, sometimes also with one or more continuous dark patches. *Epigynum* dark reddish brown to black. *Spinnerets* brown.

Cephalothorax narrow, highest behind second row of eyes; sides rather weakly rounded, high, with the sides steep. *Face* high, rather more than two-thirds as high as the chelicerae are long, the sides steep and but moderately convex. Anterior row of *eyes* moderately strongly procurved, shorter than second row by about twice the diameter of an anterior eye; anterior median eyes their radius apart, farther from the slightly smaller lateral eyes; anterior lateral eyes scarcely their diameter from the front margin of the clypeus, much farther from the eyes of the second row; eyes of the second row less than their diameter apart; eyes of third row about two-thirds as large as those of the second; quadrangle of posterior eyes one-fifth as long as cephalothorax. *Chelicerae* armed as usual.

Legs long and moderately slender, the last tarsi slender but not proportionately long; all femora conspicuously flattened laterally, each of the two posterior ones on each side concavated behind and bent conspicuously backward, the two anterior ones concavated in front side and bent forward; anterior tibiæ and metatarsi armed beneath as usual, all tarsi densely scopulate beneath, the posterior ones clearly bisected by a narrow median setose band; the anterior metatarsi also scopulate for most of the entire distance to their bases, but the posterior metatarsi not at all scopulate.

For structure of *epigynum* see Pl. XVIII, fig. 2.

Total length, 16.4 mm. Length of cephalothorax, 7 mm.; width, 5 mm.

Length of leg I, 20 mm.; tib. + pat., 7.4 mm.; met., 4 mm.

Length of leg II, 17.9 mm.

Length of leg III, 16.6 mm.

Length of leg IV, 22.6 mm.; tib. + pat., 7.5 mm.; met., 6.6 mm.

Male.—*Chelicerae* black, covered, but not densely, with black pubescence; fringe along furrow pale rufous. *Legs* yellowish or pale brown, the joints beyond patella of anterior pairs darker, reddish brown; distal ends of tibia and metatarsus of leg IV darker blackish. The hair of middle stripe of dorsum of *abdomen*, except black margins, is rufous or nearly so, the light stripes bounding it are made by golden-yellow hair. Venter with a wide median black band, which is widest at its anterior end where it spreads out back of lung-slits.

Patella I and II armed both in front and behind.

For structure of palpal organ see Pl. XVIII, fig. 3.

Total length, 15 mm. Length of cephalothorax, 7.3 mm.; width, 5.5 mm.

Length of leg I, 23.2 mm.; tib. + pat., 8.4 mm.; met., 5 mm.

Length of leg II, 21.9 mm.

Length of leg III, 18.6 mm.

Length of leg IV, 29 mm.; tib. + pat., 9 mm.; met., 9 mm.

Syn.—1842. *Lycosa punctulata* Hentz, J. Bost. Soc. Nat. Hist., p. 390.

1875. *Lycosa punctulata* Hentz, Spiders of U. S., p. 31, Pl. 3, figs. 16, 17.

1885. *Lycosa punctulata*, Emerton, Trans. Conn. Acad. Sci., IV, p. 490.

1890. *Lycosa punctulata*, Marx, Proc. U. S. N. M., 12, p. 563.

Non.-Syn.——. *Lycosa punctulata* Hentz, Stone, Proc. Acad. Nat. Sci. Phila.

1892. *Lycosa punctulata*, Banks, Proc. Acad. Nat. Sci. Phila.

——. *Lycosa punctulata*, Hentz, Fox, Proc. Ent. Soc. W., 2, p. 269.

——. *Lycosa punctulata*, Marx, Proc. Ent. Soc. Wash., II, p. 160.

1895. *Lycosa punctulata*, Banks, J. N. Y. Ent. Soc., 3, p. 91.

1900. *Lycosa punctulata*, Banks, Proc. Acad. Nat. Sci. Phila., p. 538.

1902. *Lycosa punctulata*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 552.

1904. *Lycosa punctulata*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 288.

Type location.—Pennsylvania.

Known localities.—Pennsylvania, North Carolina!, Georgia!, Alabama, Florida, Louisiana!, Mississippi!, Massachusetts, Connecticut, Rhode Island!, Indiana!, Ohio.

Lycosa frondicola Emerton, 1885.

(Trans. Conn. Acad. Sci., 6, p. 484, Pl. 46, figs. 3 to 3b.)

Female.—Sides of *cephalothorax* dark brown above, lighter toward margin; a median light brown band which is widest just behind the eye area, where it is wider than the third row; from there it very gradually narrows caudally and anteriorly passes broadly between the eyes of the third row to those of the second; the median band in life

densely clothed with light gray pubescence; sides of cephalothorax clothed with mixed black and gray pubescence, the gray predominating, increasing in abundance from above below and finally forming a narrow marginal light gray stripe in which the hair is unmixed with any black. *Chelicerae* black, clothed over basal portion with light brown pubescence, distally with black. *Labium* and *endites* dark reddish or blackish brown, lighter at tips. *Sternum* and *coxae* of legs beneath dark reddish-brown to black, the *coxae* somewhat paler basally; clothed with black hair. *Legs* brown or reddish brown with some dark annulations on the femora, which may be indistinct and which are commonly incomplete above and below; the *patellæ*, *tibiæ* and *metatarsi* of the posterior pairs of legs also normally annulate with dark, the *patellæ* showing one ring, the *tibiæ* two and the *metatarsi* three; the anterior legs not marked beyond the femora; legs densely clothed with gray pubescence, longer black hairs sparse. *Abdomen* above grayish brown, the pubescence being mixed gray and brown, the gray sometimes arranged over entire dorsum in minute spots and streaks; black pubescence over two angular spots close together in front of middle, these spots forming the angular lateral portion of an elsewhere faint basal lanceolate outline which bifurcates at its posterior end; a number of less distinct dark transverse chevron-lines behind; a black band or spot crossing over each antero-lateral angle caudally, with pubescence of same color, this band dissolving in the gray and brown pubescence behind; sides of abdomen light brown, densely covered with gray and brown pubescence, these sometimes uniformly mingled but more commonly intermixed in numerous small spots and streaks; venter with a wide median band of black back of spinnerets, the edges of which are uneven, this band frequently occupying the entire venter; at times the dark band is entirely absent. *Epigynum* reddish brown. *Spinnerets* brown.

Face low and wide, in height less than half the length of the *chelicerae*, sides rounded and strongly slanting. Dorsal line of cephalothorax highest between third eye row and dorsal groove, being convex between eyes and the posterior declivity.

Anterior row of *eyes* but slightly procurved, nearly or quite as wide as the second; anterior median eyes their radius apart, closer to the somewhat smaller lateral eyes; anterior lateral eyes one and one-half times their diameter from the front margin of clypeus, less than their diameter from eyes of second row; eyes of second row considerably less than their diameter apart; eyes of third row more than twice as far from each other as from eyes of second row; quadrangle of posterior eyes a little more than one-sixth as long as the cephalothorax.

Chelicerae massive; margins of furrow armed as usual. *Labium* a little longer than wide (16 : 15); basal excavation as usual; attenuated anteriorly, the sides below well rounded convexly, straight above; front margin incurved or concave for its entire length. *Legs* strong, moderately slender distally; tibia + patella IV evidently shorter than the cephalothorax, the metatarsus a little longer than or nearly of the same length as the width of the cephalothorax; tarsi and metatarsi I and II scopulate beneath, tarsi III and IV as usual; spines of anterior tibiae as usual; patella II armed anteriorly.

Side ridges and furrows of the *epigynum* are of the usual form; the guide is of the inversely T-shaped form, the septal piece is enlarged or widened at its middle, being thus more or less fusiform, being narrow adjacent to the transverse arms; transverse piece as long as or a little longer than the median, its arms passing well out laterally behind the lateral tubercles and being scarcely confined at the ends; guide plates along front of transverse arms narrow, even more so upon posterior end of septum where they fade out (Pl. XVIII, fig. 4).

Total length, 13 mm. Length of cephalothorax, 6.5 mm.; width, 4.7 mm.

Length of leg I, 14.6 mm.; tib. + pat., 5.3 mm.; met., 3.1 mm.

Length of leg II, 13.9 mm.

Length of leg III, 12.6 mm.

Length of leg IV, 18.5 mm.; tib. + pat., 5.8 mm.; met., 5 mm.

Male.—*Cephalothorax* in color nearly as in the female. *Legs* lighter. *Abdomen* with the black bands over the antero-lateral angles more distinctly continuing caudally as a dark band along sides of dorsum, this band behind frequently breaking up into oblique lines and spots; abdomen otherwise as in the female.

Patella I and II armed both in front and behind.

Apical portion of tarsus of *palpus* evidently shorter than the bulb, acute; auricle large and broad, the terminal part of embolus lying in it clearly exposed; tenaculum at base horizontal and rather stout, then bent forward rather abruptly and becoming very slender. (Pl. XVIII, fig. 5.)

Total length, 10 mm. Length of cephalothorax, 5.2 mm.; width, 4 mm.

Length of leg I, 14.1 mm.; tib. + pat., 4.9 mm.; met., 3.2 mm.

Length of leg II, 12.6 mm.

Length of leg III, 11.5 mm.

Length of leg IV, 15.7 mm.; tib. + pat., 5 mm.; met., 4.8 mm.

- Syn.—1877. *Tarentula modesta* Thorell, Bull. U. S. G. S. Terr., 3, No. 2, p. 520 (name preoccupied by *modesta* Keys.).
 1885. *Lycosa nigroventris* Emerton, Tr. Conn. Acad. Sci., 6, p. 488, Pl. 47, figs. 5 to 5b.
 1890. *Tarentula pudens* Marx, Proc. U. S. N. M., 12, p. 564.
 ——. *Lycosa frondicola*, Marx, *ibid.*, p. 561.
 ——. *Lycosa frondicola*, Stone, Proc. Acad. Nat. Sci. Phila., 42, p. 426.
 1892. *Lycosa frondicola*, Marx, Proc. Ent. Soc. W., 2, p. 160.
 ——. *Lycosa frondicola*, Fox, *op. cit.*, p. 269.
 ——. *Lycosa frondicola*, Banks, Proc. Acad. Nat. Sci. Phila., 44, p. 64.
 1894. *Lycosa modesta*, Banks, J. N. Y. E. Soc., 2, p. 50.
 1895. *Lycosa modesta*, Banks, Ann. N. Y. Ac. Sci., 8, p. 429.
 ——. *Lycosa frondicola*, Banks, J. N. Y. Ent. Soc., 3, p. 91.
 1902. *Lycosa frondicola*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 561, Pl. 30, figs. 28, 29.
 1904. *Trochosa frondicola*, Montgomery, *ibid.*, p. 306.

Type locality.—Massachusetts.

Known localities.—Massachusetts!, New Hampshire!, Connecticut, Rhode Island!, New York, New Jersey, Pennsylvania, District of Columbia!, Ohio, Indiana, Illinois, Iowa!, Kansas!, Montana!, Utah!, Colorado!, Arizona!.

From a study of specimens from various places in the West, I am convinced that the species described by Thorell from Colorado as *Tarentula modesta* is the same as the Eastern *L. frondicola*, and Thorell's name would have to be used except that it is preoccupied by Keyserling's species. In 1890 Marx proposed the name *pudens* to take the place of *modesta*; but as the species had been described by Emerton in 1885 as *frondicola*, the latter name must stand. A study of the male specimen upon which *L. nigroventris* was based convinces me that it is the same as *frondicola*.

L. frondicola is a widely distributed species, common especially in the central, northern and mountainous parts of the United States. It is found most frequently in and at the edges of woods, among fallen leaves and sticks. Specimens from the dryer parts of the West, as with various other species, show a tendency to lose the dark coloration, especially that of the venter. Some specimens have the venter entirely pale.

Lycosa pratensis Emerton, 1885.

(Trans. Conn. Acad., VI, p. 483, Pl. XLVI, figs. 4, 4a, 4b.)

Female.—A wide median light band, widest between third eye row and dorsal groove, and from there narrowing backward to end of *cephalothorax*, commonly constricted or indented at groove, also narrowing and passing forward between eyes of third row and reaching those of second row. Tegument of middle band light reddish brown clothed with yellowish or brownish-gray pubescence, usually two dark

longitudinal lines in wide part in front of dorsal groove; on each side, at a distance above margin greater than its own width, a narrow light band colored like the median one; elsewhere the tegument deep brown, clothed mostly with dark to blackish-brown pubescence, with grayish intermixed. *Chelicerae* dark reddish brown with grayish-brown pubescence. *Labium* and *endites* dark brown, inclined to be lighter at tips. *Sternum* reddish brown, sparsely clothed with a few short hairs of light color and more numerous long bristles of black. *Coxae* of legs beneath brown, grayish-yellow pubescence much more abundant than on sternum. *Legs* brown, darker distally, at least femora with rather faint darker rings, which on the two anterior pairs are most distinct on the meso-caudal aspect and on the two posterior pairs on the meso-cephalic aspect; clothed with shorter grayish-yellow pubescence and longer blackish or blackish-brown hair. *Abdomen* in general color reddish brown, lighter beneath; above with a complicated pattern of black lines, in part as follows: at base a lanceolate outline, giving off on each side near apical third a line running caudo-laterally to dark area at sides, its tip at middle touching apex of a chevron-mark which is followed caudally by a number of similar marks; each chevron-mark commonly double or paired, *i.e.*, consisting of two parallel chevrons separated by a light line, except sometimes at ends; on each side of chevrons irregular darker spots and blotches. The tegument of the sides with spots of black, but that of venter unmarked. The pubescence of the abdomen is yellowish-gray and brown in life, or in dry specimens, the pubescence largely concealing the complicated markings of the tegument and so arranged as to produce above two rows of light spots more or less connected by transverse light lines. Sides with light and dark pubescence, more or less in streaks and spots, but venter without markings. *Spinnerets* brown. *Epigynum* dark reddish brown.

Face low, less than half the length of the chelicerae (1 : 2.4), sides convex, widely slanting, about as wide at base as length of chelicerae, high and narrow; in profile dorsal line rather strongly convex. Anterior part of head rounded, the space between third and second rows of eyes sloping rather strongly; the first row of eyes projecting forward so as to be seen clearly from above.

Front row of *eyes* straight or slightly recurved, slightly longer than the second; anterior median eyes their radius apart, closer to the but little smaller side eyes; anterior lateral eyes about their diameter from the front margin of clypeus, closer to eyes of second row; eyes of second row not more than two-thirds their diameter apart; eyes of third row scarcely smaller than of second, their diameter from latter, more than

twice as far from each other; quadrangle of posterior eyes about one-fifth as long as the cephalothorax.

Lower margin of furrow of the *chelicerae* armed with three equidistant conical teeth, these equal in size, the third no smaller than the first. The upper margin with three teeth, the middle, as usual, much largest, the first and third about equal, both usually contiguous with base of second, or the third slightly removed.

Legs short and moderately slender; tibia + patella of fourth legs shorter than the cephalothorax; metatarsus of fourth legs much shorter than tibia + patella; anterior tarsi slightly curved, others straight; two anterior pair of femora slightly bent forward, last pair slightly bent backward; first and second tarsi scopulate; third and fourth tarsi not truly scopulate, subdensely setulose; tibiae and metatarsi of first and second legs armed beneath as usual, patella of these legs unarmed.

Epigynum as figured (Pl. XXI, fig. 3).

Total length, 13 mm. Length of cephalothorax, 5.1 mm.; width, 3.8 mm.

Length of leg I, 10.9 mm.; tib. + pat., 4.1 mm.; met., 2.1 mm.

Length of leg II, 10.6 mm.

Length of leg III, 9.2 mm.

Length of leg IV, 14 mm.; tib. + pat., 4.8 mm.; met., 3.3 mm.

Syn.—1890. *Lycosa pratensis*, Marx, Proc. U. S. N. M., 12.

1892. *Lycosa pratensis*, Banks, Proc. Phil. Acad. Nat. Sci., 44, p. 64.

1894. *Lycosa pratensis* Emerton, Trans. Conn. Acad. Sci., IX, p. 422, Pl. III, fig. IV.

1895. *Lycosa pratensis* Emerton, Banks, J. N. Y. Ent. Soc., III, p. 91.

1902. *Lycosa pratensis* Emerton, Common Sp. U. S., p. 69, figs. 168, 169, 170.

1904. *Trochosa pratensis*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 303.

Type locality.—Massachusetts, Connecticut, New Hampshire.

Known localities.—Massachusetts, Connecticut, New Hampshire!, New York!, Long Island!, Canada (mountains near Lagan, Lake of Woods, Gaspé, Anticosti, Byron I., Port Hawkesbury).

According to Emerton, in New England "this is the most common species, under stones and under leaves in winter." Also: "This does not seem to be a very active spider, and is commonly found under stones."

Its habits in New York I have found similar.

Lycosa kochii (Keyserling), 1876.

(Sub *Tarentula*, Verh. z. b. Ges. Wien, 26, p. 636, Pl. 7, fig. 18.)

Female.—*Cephalothorax* with a pale stripe as wide as third eye row,

becoming abruptly a little narrower near posterior end of pars cephalica and then gradually narrowing posteriorly. Tegument of median stripe reddish brown, but quadrangle of posterior eyes often black; median stripe clothed with gray-brown pubescence. Sides of cephalothorax darker above and becoming lighter below; clothed with gray-brown pubescence, like that of dorsal stripe, mixed with dark blackish pubescence, the brown hair becoming gradually more abundant from above below but forming no distinct marginal bands. *Chelicerae* dark red-brown with short light brown pubescence basally and darker longer hairs on distal part. *Endites* reddish brown, light at tips. *Labium* darker, blackish, also lighter distally. *Sternum* dark brown, marked by a faint paler median line, clothed with brownish-gray pubescence and longer black bristles. *Coxae* of legs beneath a little lighter than sternum. *Legs* clear brown, entirely unmarked or, more rarely, with indistinct annular markings on femora. *Palpi* similarly colored. *Abdomen* with brown-gray, brown and black hair; venter pale, immaculate; sides above finely streaked and spotted with the darker pubescence among the paler. Anterior face of abdomen with a black transverse band extending over each antero-lateral angle. At base a lanceolate outline, sometimes absent, which behind gives off a number of lines on each caudo-laterally, and is followed behind by a series of chevron-formed lines; in most on each side of dorsum a row of dark angular marks in which the ends of the chevron-lines terminate. *Spinnerets* brown, densely pubescent. *Epigynum* dark reddish brown.

Cephalothorax highest at posterior eyes, moderately low behind, a little concavated at dorsal groove. *Face* in height less than half the length of the *chelicerae*, its sides convex and widely slanting.

Anterior row of *eyes* as long as second, gently procurved; anterior median eyes more than their radius apart, about half as far from the smaller lateral eyes; anterior lateral eyes about their diameter from front margin of clypeus, farther from eyes of second row. Eyes of second row separated by three-fourths their diameter or a little more. Eyes of the third row once and a half again as far from each other as from the eyes of the second row. Quadrangle of posterior eyes about one-fifth the length of the cephalothorax.

Lower margin of furrow of *chelicerae* armed with two equal stout teeth, the upper margin with three as usual. *Labium* as wide as long; basal excavation less than one-third the total length (1:3.6); rather strongly attenuated in front with sides above straight or slightly concave below angles; anterior margin indented at middle but sides a little convex.

Tibia + patella of fourth *legs* shorter than the cephalothorax; tarsi I

and II and metatarsi of same legs except at base scopulate; tarsi of third and fourth legs clothed beneath with bristles. Patellæ of first and second legs unarmed.

Epigynum as figured (Pl. XXI, fig. 5).

Total length, 11.4 mm.; length of cephalothorax, 4.5 mm.; width, 3.4 mm.

Length of leg I, 10.5 mm.; tib. + pat., 3.9 mm.; met., 2.1 mm.

Length of leg II, 10.5 mm.

Length of leg III, 10.2 mm.

Length of leg IV, 14.5 mm.; tib. + pat., 4.8 mm.; met., 4 mm.

Male.—Colored like female but lighter; femora of legs lighter and clearer brown, tibia and more distal joints darker, reddish brown.

Patella of second legs with a spine in front.

Tibia and patella of *palpus* of same length and thickness, together about equalling the length of the tarsus. For structure of palpal organ see Pl. XXI, fig. 4.

Total length, 9.2 mm. Length of cephalothorax, 4.2 mm.; width, 3.2 mm.

Length of leg I, 10.7 mm.; tib. + pat., 3.9 mm.; met., 2.4 mm.

Length of leg II, 9.6 mm.

Length of leg III, 8.8 mm.

Length of leg IV, 11 mm.; tib. + pat., 3.9 mm.; met., 2.6 mm.

Type locality.—"North America."

Known localities.—Colorado!, Utah!, Oregon, Arizona!, California!

Lycosa gulosa Walckenaer, 1837.

(Ins. Apt., 1, p. 338.)

Female.—*Cephalothorax* dark reddish brown crossed by blackish radiating lines; a wide median light stripe which is constricted between thoracic groove and third eye row and again behind the groove, widest in front of the first constriction, extending to the second eye row in front; the median light brown band clothed with light gray pubescence; on each side a supramarginal irregular edged band of same color and pubescence as the median one; cephalothorax except on light stripes clothed with dark brown pubescence. *Chelicerae* black, paler distally, clothed for most of length with yellowish pubescence, distally with longer dark brown hairs; the fringe along furrow rust colored. *Labium* and *endites* deep brown, paler at tips. *Sternum* deep reddish brown or, more rarely, black, clothed with short grayish-brown and longer dark brown pubescence. *Coxæ* of legs beneath brown to reddish-brown, lighter than sternum. *Legs* reddish brown, all joints except

the tarsi with black annulations which are usually more distinct proximally and deeper above on femora than ventrally; clothed with brown hair which is also the color of the scopulæ. *Abdomen* above grayish-brown, the pubescence consisting of gray and brown intermixed; at base a dark, deeper margined, sublanceolate stripe ending obtusely or bifurcating at the middle, but this basal mark frequently inconspicuous and sometimes absent; posterior portion of dorsum rarely with some dark chevron-shaped cross-lines; a black spot over each antero-lateral angle which is usually followed caudad by a row of dark angular spots and marks along the sides; sides and venter yellowish or grayish brown, the pubescence, as on dorsum, being light and dark often intermixed in fine spots and streaks; the tegument of venter often showing two pairs of dark lines or stripes converging toward the spinnerets; entire animal darkening with age, the venter then showing usually a broad dark brown to black band over its length from genital furrow to the spinnerets. *Spinnerets* brown. *Epigynum* dark reddish-brown to black.

Face about half as high as the length of the chelicerae, sides rounded and slanting; width at base less than the length of the chelicerae. Dorsal line of cephalothorax highest at third eye row, somewhat concavated at median furrow.

Anterior row of *eyes* considerably shorter than the second (by twice the diameter of a lateral eye or more), moderately procurved; anterior median eyes less than their radius apart; anterior lateral eyes about two-thirds as large as the median, a little less than their diameter from eyes of second row and a little more than their diameter from front margin of clypeus; eyes of second row large, about three-fifths their diameter apart; eyes of third row but little smaller than those of second (ad. 5 : 6), more than twice as far from each other as from eyes of second row; quadrangle of posterior eyes between one-fifth and one-sixth the length of the cephalothorax.

Chelicerae with furrows armed as usual. *Labium* nearly as wide as long, not much attenuated; front margin concavated. *Legs* with tibia + patella IV of same length as cephalothorax or a very little longer; metatarsus IV longer than the cephalothorax is wide; anterior tibiae and patella armed as usual; tarsi and metatarsi I and II scopulate; tarsi III and IV as usual.

Epigynum broadly ovate with posterior end widely truncate; side ridges relatively very thick; septal piece of guide in front of enlarged posterior end with sides parallel or nearly so, the femur at its side narrow and not much differing in width from anterior end back to the caudal enlargement of guide (Pl. XXI, fig. 7).

Total length, 14 mm. Length of cephalothorax, 7.7 mm.; width, 6 mm.

Length of leg I, 19.7 mm.; tib. + pat., 7.4 mm.; met., 4.1 mm.

Length of leg II, 19.4 mm.

Length of leg III, 18.6 mm.

Length of leg IV, 24.1 mm.; tib. + pat., 7.8 mm.; met., 6.7 mm.

Male.—Colored nearly as in the female. *Legs* dark brown or blackish distally, showing mostly no rings or marks except on femora. *Palpi* reddish yellow with ends of joints dark and some dark marks on femora.

Patella of palpus as long as the tibia, these two joints together of about the same length as the tarsus; terminal portion of palpus a little shorter than the bulb.

Embolus bending outward and somewhat distally from base, resting upon the lectus only across the auricle, the greater part of its length being supported only by its much elongated basal flap (Pl. XXI, fig. 6).

Total length, 11.2 mm. Length of cephalothorax, 5.5 mm.; width, 4.8 mm.

Length of leg I, 19.7 mm.; tib. + pat., 7.1 mm.; met., 4.6 mm.

Length of leg II, 18.5 mm.

Length of leg III, 17.3 mm.

Length of leg IV, 22.8 mm.; tib. + pat., 7 mm.; met., 6.7 mm.

Syn.—1876. *Tarentula pulchra* Keyserling, Verh. z. b. Ges. Wien, 26, p. 628, Pl. 7, figs. 13, 14.

1885. *Lycosa kochii* Emerton (nec Keyserling), Trans. Conn. Acad. Sci., 6, p. 485, Pl. 46, figs. 6 to 6c.

1890. *Lycosa kochii* Stone, Proc. Acad. Nat. Sci. Phila., 42, p. 426.

1892. *Lycosa kochii* Marx, Proc. Ent. Soc. W., 2, p. 160.

— *Lycosa kochii* Banks, Proc. Acad. Nat. Sci. Phila., p. 64.

1902. *Lycosa kochii* Emerton, Common Sp. U. S., p. 74, figs. 179, 180.

— *Lycosa purcelli* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 566, Pl. 30, figs. 30, 31.

1904. *Lycosa pulchra* (Keys.), Chamberlin, Canad. Ent., p. 147.

— *Lycosa euepigynata*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 279, Pl. XVIII, figs. 1, 2.

— *Lycosa insopila*, Montgomery, *ibid.*, p. 280, Pl. XVIII, figs. 3, 4.

— *Trochosa purcelli*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 305.

Type locality.—"North America."

Known localities.—Connecticut, Massachusetts, Rhode Island!, New Hampshire!, New York!, Pennsylvania, New Jersey, District of Columbia!, Virginia North Carolina!, Alabama!, Mississippi!, Texas!, Kansas!, Indiana, Utah!

Types in collection of Dr. Koch.

A strongly marked and widely distributed species which, as might be expected, is subject to some variations in size and coloration. The

epigynum and the peculiar palpus of the male are constant in essential features and at once reveal the species beneath more superficial differences. The pattern of the markings on the legs, the cephalothorax and of the dorsum of abdomen remain pretty nearly the same always except as to depth and distinctness of the colors. The venter of the abdomen becomes dark or even black with age, the entire animal also then taking on a darker color.

Lycosa modesta (Keyserling), 1876.

(Sub *Tarentula*, Verh. z. b. Ges. Wien, p. 626, Pl. VII, figs. 11, 12.)

Female.—*Cephalothorax* with a light median band as wide as space between eyes of third row; sides of median band nearly straight or slightly curved convexly, converging gradually caudally, in front reaching eyes of second row but there commonly darker; median band with tegument light reddish brown, darker between eyes, clothed with brown-gray pubescence; on each side a narrow marginal and a narrow supra-marginal line of gray pubescence like that upon middle band, the two marginal lines often indistinctly separated. Sides of cephalothorax deep brown or nearly black, clothed with mixed dark brown and brownish-gray pubescence, the gray arranged in radiating streaks, more abundant below. *Che'icerae* dark red-brown, lighter distally, clothed with dark brown hairs except below and along furrow, where they are lighter and clearer. *Labium* and *endites* dark brown, light at tips. *Sternum* shining reddish black or deep brown, sparsely provided with dark hairs about borders. *Coxae* beneath dark brown, paler at bases. *Legs* brown, darker distally, especially the tibia and metatarsus, the tarsus being lighter on anterior pairs; annuli above, which are more obscure beneath, clothed with shorter gray and more sparse longer and stiffer hairs. *Scopulae* grizzly brown. *Abdomen* having the tegument brown mottled with light and dark; a black lanceolate outline at base which on each side posteriorly gives off a number of lines caudo-laterally, the basal mark sometimes absent; lanceolate mark followed behind by a series of black transverse chevron-lines; in most on each side of the dorsum behind a row of white spots in which the ends of the dark chevron-lines terminate, these spots formed of bunches of white hair; a black mark over each antero-lateral angle; sides brown with darker mottlings and streaks and spots of gray or whitish hair. *Venter* black with some light spots at sides. Pubescence of *abdomen* is light gray or white and a darker color, dark smoky gray to black, the latter found unmixed on venter, the former predominating above. *Spinnerets* brown. *Epigynum* reddish brown and figured.

Cephalothorax moderately high and steep sided, relatively wide in front. In profile line of dorsum highest behind third eye row, concavated at front of dorsal furrow. Face low, in height hardly half the length of the chelicerae. Face at base about wide as length of chelicerae, sides more than usually widely slanting, more convex below.

Anterior row of eyes a little shorter than the second, procurved; anterior median about their radius apart, twice as large in diameter as the lateral eyes; anterior lateral eyes nearly their diameter from the front margin of the clypeus, more than their diameter from eyes of second row; anterior median eyes less than half their diameter from eyes of second row and nearly as close to front margin of clypeus; eyes of second row scarcely more than half their diameter apart, two-thirds their diameter from eyes of third row which are two-thirds or a little more as large; eyes of third row twice as far from each other as from eyes of second row. Cephalothorax 5.5 times as long as the quadrangle of posterior eyes.

Legs short, the fourth pair less than three times the length of the cephalothorax; tibia + patella IV shorter than the cephalothorax; metatarsus IV shorter than tibia + patella; tarsi and metatarsi I and II scopulate, the scopulae not dense; tarsi III and IV with very thin scopulae at sides, the ventral surface mostly occupied by a broad band of long setae; tibia + metatarsus I and II armed as usual beneath; patella I and II unarmed.

Total length, 11.2 mm. Length of cephalothorax, 4.9 mm.; width, 3.7 mm.

Length of leg I, 9.8 mm.; tib. + pat., 3.7 mm.; met., 1.8 mm.

Length of leg II, 9.3 mm.

Length of leg III, 9.1 mm.

Length of leg IV, 12.6 mm.; tib. + pat., 4 mm.; met., 3.5 mm.

Male.—*Cephalothorax* relatively narrower in front than in female and more depressed. Patella I and II unarmed. Tibia + patella IV shorter than cephalothorax.

Patella as long as tibia, the latter thick distally. Femur laterally compressed above with 1, 1, 3 spines.

Total length, 8.4 mm. Length of cephalothorax, 4.6 mm.; width, 3.4 mm.

Length of leg I, 11.9 mm.; tib. + pat., 4.3 mm.; met., 2.7 mm.

Length of leg II, 10.2 mm.

Length of leg III, 10 mm.

Length of leg IV, 13.4 mm.; tib. + pat., 4.4 mm.; met., 2.7 mm.

- Syn.—1890. *Tarentula modesta*, Marx, P. U. S. N. M., p. 564.
1902. *Lycosa sepulchralis* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 543, Pl. XXIX, fig. 7.
1903. *Lycosa sepulchralis* Montgomery, *ibid.*, p. 645, Pl. 29, fig. 7.
1904. *Trochosa sepulchralis*, Montgomery, *ibid.*, p. 307.

Type locality.—Maryland (Baltimore).

Habitat.—Maryland, District of Columbia, Pennsylvania!, Texas!.

Lycosa pictilis Emerton, 1885.

(Tr. Conn. Acad. Sci., 6, p. 485, Pl. 46, figs. 5 to 5b.)

Female.—*Cephalothorax* with a median grayish band (of pubescence) which, beginning at the second eye row, passes between the eyes of third row and then abruptly bulges on each side, being much wider than eye area midway between eyes and dorsal groove, then narrowing to dorsal groove where it is about same width as eye area; parallel sided to posterior declivity and then narrowing down the declivity; the median band, while chiefly of gray hair, has intermixed brown hair which is more abundant anteriorly between eyes; in wide area back of eyes an intramarginal line on each side is formed of brown hair, these lines being parallel to the sides and merging together in the brown between the eyes. Sides of cephalothorax chocolate brown, clothed with brown pubescence; a narrow marginal and a similar supramarginal line of grayish hair on each side. *Chelicerae* reddish black. *Labium* with gray pubescence. *Sternum* blackish brown. *Coxae* of legs beneath paler brown like other joints of legs. *Legs* dark brown; femora lighter beneath on basal half, apically on most femora two interrupted light rings and a few light, transverse marks above elsewhere. *Tibia* with several light rings, which on the anterior pair may be confluent beneath; other joints unmarked. *Abdomen* beneath at sides dusky brown, having a blackish-brown tegument covered with brown hair, rather darker on sides above; a black spot on each antero-lateral angle which encloses a light spot, the latter nearly breaking through lower margin of spot; mesally from the black spot is a large light spot on each side; along the inner posterior margin of each of these orange spots being a short oblique black line, the two lines not meeting in the middle; posteriorly is a series of median black chevron-marks, the first divided or nearly so at middle; at the outer end of each of the chevrons is a light spot enclosed by black, the light spots thus forming a lateral series on each side; in front of each half of each chevron is a light colored spot; these spots in front of the posterior chevrons confluent. The series of light spots on each side in life covered with grayish or gray pubescence; the large

light spots in front covered with orange-colored or with rusty-brown hair and connected at middle with gray hair; light transverse marks in front of posterior chevrons covered with gray hair; middle of dorsum in front covered with mostly gray and with fewer brown hairs. *Epigynum* and *spinnerets* black-brown. *Legs* over the light spots with partly gray pubescence; pubescence elsewhere brown.

Median dorsal line of *cephalothorax* straight, not depressed at dorsal furrow. Sides of *face* convex and widely slanting.

Anterior row of *eyes* procurved, but little shorter than the second row; anterior lateral eyes their diameter or a little farther from front margin of the clypeus, a little farther from eyes of second row; anterior median eyes less than their diameter apart (four-sevenths), closer to the smaller lateral eyes (1 : 1.7); eyes of second row fully their diameter apart; anterior median eyes about their diameter from eyes of second row; quadrangle of posterior eyes as wide in front as long, about one-fifth as long as the cephalothorax.

For structure of *epigynum* see Pl. XIX, fig. 8.

Total length, 11.5 mm. Length of cephalothorax, 5 mm.; width, 3.6 mm.

Length of leg I, 13.1 mm.; tib. + pat., 4 mm.; met., 2.3 mm.

Length of leg II, 11 mm.

Length of leg III, 10.5 mm.

Length of leg IV, 14.9 mm.; tib. + pat., 4.6 mm.; met., 4.1 mm.

Male.—Coloration of *cephalothorax* and *legs* nearly as in female. *Abdomen* with nearly same markings but black spot over front angles circular, not enclosing a light spot; venter with gray pubescence; gray pubescence of dorsum much more abundant than in female, the rusty colored pubescence largely replaced by it.

Tarsus of *palpus* some (11 : 13) shorter than the tibia + patella; patella and tibia of about same thickness, the former slightly longer; tibia but slightly thickened distally; tarsus clearly wider than tibia (5 : 4).

For structure of palpal organ see Pl. XIX, fig. 6.

Total length, 9.3 mm. Length of cephalothorax, 5.3 mm.; width, 3.9 mm.

Length of leg I, 13.4 mm.; tib. + pat., 4.5 mm.; met., 3.3 mm.

Length of leg II, 12.4 mm.

Length of leg III, 12.3 mm.

Length of leg IV, 16.8 mm.; tib. + pat., 5 mm.; met., 4.7 mm.

Syn.—*Lycosa pictilis*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 287, Pl. XVIII, figs. 7, 8.

Locality.—New Hampshire!.

"This very distinct species is abundant among the moss and low shrubs on the upper part of Mt. Washington, New Hampshire, and the neighboring mountains."

The descriptions above are based upon the type specimens.

Lycosa fumosa Emerton, 1894.

(Tr. Conn. Acad. Sci., 9, p. 421, Pl. 3, figs. 1, 1a.)

Female.—*Cephalothorax* nearly black, of a reddish tinge. *Chelicerae* the same color as cephalothorax. *Labium* and *endites* lighter in color than cephalothorax, pale distally. *Sternum* similar to cephalothorax but lighter. *Coxae* of legs beneath brown, clearly paler than sternum. *Legs* a little lighter and more reddish than cephalothorax, the femora slightly darker than other joints, all joints unmarked or the femora with a few faint light spots. *Palpi* like legs. *Cephalothorax*, *sternum* and *legs* clothed with gray-brown pubescence, being probably bleached in the alcohol. *Abdomen* entirely black, slightly paler beneath especially in front of lung-slits, clothed with brown pubescence; pubescence of entire body and legs rather dense.

Cephalothorax comparatively low, angularly depressed in profile at dorsal groove. *Face* one-half as high as the length of the chelicerae. Anterior row of *eyes* of the same length as the second or very nearly so, nearly straight, the center of lateral eyes being but slightly lower; anterior median eyes slightly smaller than the lateral; the tubercles of the lateral eyes increase their apparent size; anterior median eyes their full diameter apart, same distance from the lateral eyes, more than their diameter from eyes of second row; anterior lateral eyes more than their diameter from eyes of second row (nearly one and one-third), closer, but little more than diameter, from front margin of clypeus; eyes of second row not fully their diameter apart; eyes of third row three-fourths as large as those of second; quadrangle of posterior eyes a little wider in front than long (11.5 : 10) unusually wide behind, being there nearly twice as wide as long (19 : 10), the *pars cephalica* being wider than usual and the third eyes set well out laterally; the quadrangle of posterior eyes between one-fifth and one-sixth as long as the cephalothorax (about 1 : 5.6).

Lower margin of the furrow of the *chelicerae* with three stout teeth, the third being a little stouter than the others; the first two with posterior face more curved than the anterior and so appearing bent forward; upper margin with three teeth, the first minute, the middle stout and acute as usual, the third as long as median but more slender.

Legs with the anterior tibiae armed beneath with three pair of spines, these short as usual, the apical pair reduced; anterior patella armed behind; tibiae II armed in front and behind; tibia + patella IV a little longer than cephalothorax, shorter than tibia + patella I.

Total length, 16 mm. Length of cephalothorax, 7 mm.; width, 5.8 mm.

For structure of *epigynum* see Pl. XIX, fig. 2.

Length of leg I, 21.6 mm.; tib. + pat., 8.2 mm.; met., 5 mm.

Length of leg II, 21.6 mm.

Length of leg III, 18.9 mm.

Length of leg IV, 23.7 mm.; tib. + pat., 8 mm.; met., 7 mm.

Male.—*Cephalothorax*, *chelicerae* and *sternum* blackish. *Labium*, *endites* and *coxae* of legs beneath dark brown, as in female. Pubescence throughout brown, dense.

For structure of palpal organ see Pl. XIX, fig. 3.

Total length, 11 mm. Length of cephalothorax, 6 mm.; width, 5 mm.

Length of leg I, 23.6 mm.; tib. + pat., 8 mm.; met., 6.8 mm.

Length of leg II, 2.3 mm.

Length of leg III, 21.6 mm.

Length of leg IV, 24.4 mm.; tib. + pat., 7.7 mm.; met., 7.7 mm.

Locality.—Canada!.

The description above was taken from the types.

Lycosa beanii Emerton, 1894.

(Tr. Conn. Acad. Sci., 19, p. 421, Pl. 3, figs. 2 to 2b.)

Female.—Sides of *cephalothorax* and eye region blackish brown; back of eyes a lighter reddish brown median stripe as wide as the eye area; the median stripe narrowing distinctly to posterior declivity, constricted in front of dorsal groove, widening out again at posterior margin. No light colored lateral stripes. *Chelicerae* blackish or blackish brown. *Labium* and *endites* reddish brown. *Sternum* deep brown, faintly paler along middle. *Coxae* of legs beneath distinctly lighter than sternum, brown. *Legs* brown, paler than sides of cephalothorax, entirely unmarked below but femora above and on sides, especially on posterior pairs, with rather indistinct closely arranged dark and light transverse markings. *Abdomen* brown down middle, blackish brown across front declivity and in a band passing over each antero-lateral angle and down the side of dorsum. A dark basal lanceolate mark evident reaching the middle of dorsum behind. Posteriorly a series of dark angular bars crossing from side to side, leaving light colored chevrons

between, farther forward, at and just behind the middle, the sides of the dark lateral bands simply dentate, the teeth not connected across middle. Sides becoming lighter from above below, the lower portion and the venter rather light brown, the venter appearing to have been somewhat darker down its middle behind lung-slits in life. *Spinnerets* brown. *Epigynum* dark reddish brown.

Cephalothorax highest as usual at third eye only slightly descending posteriorly; the dorsal line nearly horizontal, a little depressed at dorsal groove. *Face* with sides sloping moderately, in height about half the length of the chelicerae. Anterior row of eyes clearly shorter than the second, procurved; diameter of anterior median eyes is to diameter of eye of second row as 1 : 2.2; anterior lateral eyes once and a half their diameter from margin of clypeus, a little closer to eyes of second row; anterior median eyes their diameter from eyes of second row, and one-half their diameter apart, scarcely closer to lateral eyes (which are scarcely smaller); eyes of second row a little more than three-fourths their diameter apart; posterior quadrangle of same length and breadth, wider behind than in front in ratio of nearly 9.25 : 7, and about one-fifth as long as cephalothorax.

Lower margin of the furrow of the *chelicerae* with two stout and equal teeth; upper margin of the furrow with three teeth, the first of these is low but wide and bluntly rounded, the second as usual much largest, conical and acute, the third of intermediate size, shaped like the second.

Tarsi of *legs* not curved, all straight; first two pairs of femora bent forward; third femora nearly straight, scarcely bent backward; fourth femora a little bent backward. *Scopulae* distributed about as usual but rather sparse, divided by setose band on all tarsi!

Epigynum 1 mm. wide and about same length (*i.e.*, shorter than any of coxae, the third of which is 1.6 mm. long) (Pl. XIX, fig. 5).

Total length, 12 mm. Length of cephalothorax, 5.3 mm.; width, 3.8 mm.

Length of leg I, 11.6 mm.; tib. + pat., 6.4 mm.; met., 2.4 mm.

Length of leg II, 10.9 mm.

Length of leg III, 10.4 mm.

Length of leg IV, 14.2 mm.; tib. + pat., 4.2 mm.; met., 4.2 mm.

Male.—*Coloration* very nearly the same as in female. *Legs* not at all marked, the first and second femora darker than posterior ones, first tibia also darker. *Palpi* darker than in the female, the tarsi a little darker than other joints. Inner margins of dark lateral bands of dorsum dentate and serrate, but not with any connecting angular or chevron-shaped marks across middle.

For structure of palpal organ see Pl. XIX, fig. 4.

Total length, 8.8 mm. Length of cephalothorax, 4.5 mm.; width, 3.3 mm.

Length of leg I, 10.4 mm.; tib. + pat., 3.7 mm.; met., 2 mm.

Length of leg II, 9.8 mm.

Length of leg III, 9.6 mm.

Length of leg IV, 12.8 mm.; tib. + pat., 4 mm.; met., 3.6 mm.

Locality.—Canada!.

The descriptions above are from the types.

Lycosa albohastata Emerton, 1894.

(Tr. Conn. Acad. Sci., 9, p. 423, Pl. 3, figs. 3 to 3b.)

Male.—*Cephalothorax* with a wide median band of reddish-brown color extending to clypeus anteriorly; in front this band is as wide as the clypeus and wider than the eye area, narrowing gradually and constantly backward to a point at posterior margin, the sides nearly straight; this band appears to have been clothed in life with light gray pubescence. Sides of cephalothorax dark brown, presenting a reddish-brown background covered with radiating blackish lines which are more or less confluent above and below. *Chelicerae* reddish brown. *Labium* and *endites* brown, paler distally. *Sternum* black or very nearly so. *Coxae* beneath brown. *Legs* brown of orange hue; all joints except tarsi with black annuli, these annuli incomplete beneath except on femora where they are most distinct. *Abdomen* with a light basal mark, the sides of which are nearly parallel to its middle, then narrowed to a truncate point at middle of abdomen; this basal mark is densely clothed with white hairs and is margined at sides and behind by black, mostly broken into irregularly elongated spots, from the sides of this black extend somewhat broken lines of black more or less obliquely outward and backward, the last two lines extending from the angles of the truncate apex of basal mark; behind in the middle is a series of transverse black lines, and along each side a number of black dots; on each side of dorsum behind a row of light spots clothed with whitish hairs; the background of abdomen above orange-brown; sides of abdomen orange-brown mottled with numerous irregular black dots and marks; venter with clear orange-brown, darkened in front of lung-slits and along a narrow border laterally and posteriorly. *Palpi* with the femora black, not distinctly ringed, the patella and tibia orange, the tarsus darker, blackish. Pubescence on entire body except where stated otherwise orange-brown.

Face as compared with *chelicerae* low and relatively wide, the length

of the *chelicerae* being about two and one-half times as great as the height of the face; sides sloping and rounded as usual. Anterior row of *eyes* slightly procurved, nearly as long as the second; anterior median eyes three-fourths their diameter apart; anterior lateral eyes three-fourths as large as the median, closer to the median than the latter are to each other (2 : 3); anterior lateral eyes their diameter from front margin of clypeus and the same distance from eyes of second row; anterior median eyes scarcely more than one-half their diameter from eyes of second row; eyes of second row slightly more than twice as large in diameter as the anterior median eyes (9 : 4); quadrangle of posterior eyes as wide in front as long; wider behind than in front in ratio of 6.3 : 4.6; between one-fourth and one-fifth as long as cephalothorax.

Lower margin of the furrow of the *chelicerae* with three *teeth* which are stout and conical, the third a little reduced; upper margin with three teeth as usual, the first minute. *Labium* of usual shape, slightly curved for entire width. *Legs* with tibia + patella IV of same length as the cephalothorax; metatarsus distinctly longer than the width of the cephalothorax; both the posterior and the *anterior* tarsi with the scopulae divided by a median setose band, the anterior metatarsi with only sparse scopular hairs.

Tibia of *palpus* of same length as patella and of same thickness proximally, the tibia widening moderately distally; tibia and patella together a little longer than the tarsus.

For structure of palpal organ see Pl. XIX, fig. 1.

Total length, 6 mm. Length of cephalothorax, 3 mm.; width, 2.2 mm.

Length of leg I, 8.2 mm.; tib. + pat., 2.8 mm.; met., 2 mm.

Length of leg II, 7.7 mm.

Length of leg III, 7.3 mm.

Length of leg IV, 9.6 mm.; tib. + pat., 3 mm.; met., 2.7 mm.

Female.—Coloration of the female is nearly same throughout as male. *Eye* arrangement and general structure as for the male. *Legs* with tibia + patella shorter than the length of the cephalothorax; metatarsus IV very little longer than cephalothorax is wide.

The *epigynum* of specimen studied (type) is not entirely adult.

Total length, 7.2 mm. Length of cephalothorax, 3.7 mm.; width, 2.8 mm.

Length of leg I, 8 mm.; tib. + pat., 2.9 mm.; met., 1.8 mm.

Length of leg II, 7.9 mm.

Length of leg III, 7 mm.

Length of leg IV, 11.1 mm.; tib. + pat., 3.2 mm.; met., 2.9 mm.

Locality.—Laggan, Canada!

The description above was taken from the types. Two males from the valley near Laggan and young females from the neighboring mountains 6,000 to 7,000 feet high.

Lycosa quinar Emerton, 1894.

(Tr. Conn. Acad. Sci., 9, p. 422, Pl. 3, figs. 5, 5a.)

Female.—*Cephalothorax* dark reddish brown without markings. *Chelicerae* reddish black. *Labium* and *endites* colored like cephalothorax, the endites scarcely paler distally, the labium not paler distally. *Sternum* like cephalothorax. *Coxae* beneath lighter than sternum. *Legs* reddish brown, paler beneath, unmarked except for a few fine and inconspicuous longitudinal black lines, which are most distinct on femora, on each of which there is one on the dorsal surface. *Abdomen* dark brownish or gray, faintly paler along the middle, with a series of inconspicuous black marks each side. *Epigynum* reddish brown. *Spinnerets* concolorous with abdomen.

Cephalothorax shaped about as usual. *Face* with sides rounded and widely sloping, in height about half the length of the *chelicerae*.

Anterior row of *eyes* well procurved, a line passing through the center of the median eyes being tangent to the posterior margins of the lateral eyes; anterior median eyes less than their diameter apart (five-sevenths) some closer to the subequal lateral eyes; anterior lateral eyes their diameter from front margin of clypeus, a little farther from eyes of second row; anterior median eyes their diameter from eyes of second row; eyes of second row four-fifths their diameter apart; quadrangle of posterior eyes a little wider in front than long (9.75:6.75); between one-fifth and one-sixth the length of the cephalothorax (nearly 5.5:1).

Lower margin of furrow of *chelicerae* with three teeth equal in size or, if any different, the third largest, moderately stout and acute; upper margin with three teeth of usual proportions.

Legs stout; tarsi all straight, not at all curved; third femora straight; fourth femora a little bent backward, not excavated behind; second and first femora bent forward and their anterior sides moderately excavated near middle; tarsi and metatarsi of legs I and II scopulate; tarsi of legs III and IV divided by a median setose band as usual.

Total length, 10 mm. Length of cephalothorax, 5.2 mm.; width, 4 mm.

For structure of epigynum see Pl. XIX, fig. 7.

Length of leg I, 12 mm.; tib. + pat., 4.4 mm.; met., 2.6 mm.

Length of leg II, 11.6 mm.

Length of leg III, 11.4 mm.

Length of leg IV, 15.8 mm.; tib. + pat., 4.9 mm.; met., 4.6 mm.

Locality.—Canada (Alberta)!

The types are two females collected by J. B. Tyrrell in 1886, and from these the description above was made.

***Lycosa rubicunda* (Keys.), 1876.**

Female.—*Cephalothorax* with a light brown median band which expands anteriorly so as to enclose the eye area, than which it is much wider anteriorly; reaching front margin of clypeus; behind eyes it narrows rapidly, running almost to a point at dorsal groove, here usually sending out a narrow branch on each side and behind continuing as a narrow line to end of cephalothorax. Pubescence of median band light or yellowish brown, rather sparse. Sides of cephalothorax dark reddish brown, pubescence sparse; a marginal light band each side, of same color and pubescence as median band. Sometimes uniform in color, without distinct markings. Cephalothorax appearing polished even when not rubbed because of sparseness of pubescence. *Chelicerae* dark reddish brown clothed with moderately long brown pubescence. *Labium* and *endites* brown, light distally. *Sternum* and *coxae* of legs beneath brown. *Legs* brown, paler beneath, usually with dark annuli which are obscure or absent beneath but distinct above. *Abdomen* with yellowish-brown and black pubescence; at base a lanceolate outline reaching to middle, from each side giving off latero-caudally a series of dark lines and followed behind by a series of chevron-marks; sides of dorsum with numerous dark dots and dashes; venter grayish brown with some dark spots and a narrow dark median line extending from spinnerets forward and widening in front to enclose the epigynum and sometimes also widening about spinnerets. *Spinnerets* yellowish. *Epigynum* reddish brown.

Cephalothorax high, with the sides steep; rather narrow, the sides behind not strongly bulging. *Pars cephalica* long; in profile line of dorsum conspicuously arched, rounded in front, the highest point behind eyes of third row. *Face* low, in height considerably less than half the length of the *chelicerae*; sides of face convex, widely slanting.

First *eye* row clearly longer than second, slightly recurved; anterior median eyes less than their radius apart, half as far from the smaller lateral eyes; anterior lateral eyes their diameter from front margin of clypeus, less than their diameter from eyes of second row; eyes of second row about half their diameter apart, a little farther from the but little smaller eyes of third row, which are fully four times as far

from each other; third row twice the diameter of one of its eyes wider than second row; quadrangle of posterior eyes much wider than long; cephalothorax six and a half times the length of the quadrangle of posterior eyes.

Teeth of margins of furrow of *chelicerae* as usual.

Legs short and moderately stout, the fourth pair less than three times the length of cephalothorax; tibia + patella of fourth legs shorter than cephalothorax, metatarsus of fourth legs clearly shorter than tibia + patella; tarsi I and II and distal part of metatarsi I and II scopulate, scopulae not dense. Tarsi III and IV with sparse scopular hairs laterally elsewhere clothed with long bristles.

Tibiae and metatarsi I and II armed beneath as usual, the spines rather small and slender. Patellae I and II each armed in front with a single spine.

Epigynum as figured (Pl. XIX, fig. 9).

Total length, 9.6 mm. Length of cephalothorax, 4.5 mm.; width, 3.3 mm.

Length of leg I, 9.7 mm.; tib. + pat., 3.6 mm.; met., 1.9 mm.

Length of leg II, 9.4 mm.

Length of leg III, 8.8 mm.

Length of leg IV, 12.1 mm.; tib. + pat., 4 mm.; met., 3.2 mm. .

Syn.—1885. *Lycosa polita* Emerton, Trans. Conn. Acad. Sci., 6, p. 484, Pl. 46, figs. 2, 2a, 2b, 2c.

1890. *Lycosa polita*, Marx, Proc. U. S. N. M., 12, p. 563.

— *Trochosa rubicunda*, Marx, *ibid.*, p. 564.

1892. *Lycosa polita*, Banks, Proc. Acad. Nat. Sci. Phila., 44, p. 66.

— *Lycosa polita*, Marx, Proc. Ent. Soc. W., 2, p. 160.

— *Lycosa polita*, Fox, Proc. Ent. Soc. W., 2, p. 267.

1893. *Lycosa rubicunda* Keyserling, Banks, J. N. Y. Ent. Soc., I, p. 125.

1894. *Lycosa polita* Emerton, Trans. Conn. Acad., 9, p. 422.

1902. *Lycosa polita* Emerton, Common Spiders of U. S., p. 70, fig. 171.

1904. *Trochosa rubicunda*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 307, Pl. XIX, fig. 30.

Type locality.—Eastern Massachusetts; Albany, New York; New Haven, Connecticut.

Known localities.—Massachusetts, Connecticut!, Rhode Island!, New York!, Indiana, District of Columbia.

“Under stones in summer and under leaves in winter. Eggs in June and July.”

Lycosa avara (Keyserling), 1876.

(Sub *Trochosa*, Verh. z. b. Ges. Wien, 26, p. 661, Pl. VIII, figs. 38, 39.)

Female.—*Cephalothorax* with a light median band widest between third eyes and dorsal groove where it is as wide as third eye row;

somewhat abruptly contracted at front of groove and then gradually narrowing to posterior end of cephalothorax, reaching second eye row in front; tegument of median band light brown clothed with yellow or brown-gray pubescence; on each side a narrow marginal and a wider supramarginal band of same color and pubescence as the median one; sides of cephalothorax elsewhere with dark reddish brown tegument, the pubescence over which is mixed light brown and blackish. Region about eyes usually blackish. *Chelicerae* dark red-brown, the lateral condyles red, the claw also reddish. *Labium* and *endites* dark reddish brown, paler at tips. *Sternum* lighter reddish brown, with shorter brown gray pubescence and longer black bristles. *Coxae* of legs beneath brown. *Legs* brown with indistinct darker annuli, clothed with shorter and more dense gray pubescence and longer dark brown or blackish bristles. Tegument of *abdomen* above reddish brown, lighter beneath; pubescence above intermixed gray and brown and with black forming a mostly obscure lanceolate outline at base and scattered spots; sides and venter also with small darker streaks and spots in the pubescence; pubescence beneath lighter than above. *Spinnerets* brown. *Epigynum* reddish brown.

Sides of *face* convex, slanting outward, a little less than half as high as the *chelicerae* are long, at base nearly as wide as length of *chelicerae*; in profile line of dorsum highest at third eyes, convex between third eyes and posterior declivity.

Anterior row of *eyes* slightly procurved, scarcely shorter than the second; anterior median eyes less than their radius apart, as far from the smaller lateral eyes; anterior lateral eyes not fully one-half their diameter from front margin of clypeus and about their diameter from eyes of second row; eyes of second row, considerably less than their diameter apart, scarcely farther from eyes of third row, which as usual are more than twice as far from each other; eyes of third row smaller than those of second nearly in ratio of 2.5 : 3. Quadrangle of posterior eyes one-fifth the length of cephalothorax.

Three equal and equidistant conical teeth along lower margin of furrow of *chelicerae*; upper margin of furrow with three teeth as usual, the first and third nearly equal, the third more removed from second.

Legs slender; tibia + patella IV shorter than cephalothorax; metatarsus IV scarcely shorter than tibia + patella; posterior femora (IV) bent backward, second anterior pair of femora a little curved forward; tarsi I and II a little curved, tarsi III and IV with scopulae divided by median setose bands; both tarsi and metatarsi I and II scopulate for entire length; tibiae and metatarsi I and II armed as usual; patella I and II not armed.

For *epigynum* see Pl. XX, fig. 2.

Total length, 13 mm. Length of cephalothorax, 5 mm.; width, 3.7 mm.

Length of leg I, 10.8 mm.; tib. + pat., 3.9 mm.; met., 2.1 mm.

Length of leg II, 10.4 mm.

Length of leg III, 10.1 mm.

Length of leg IV, 13.7 mm.; tib. + pat., 4.1 mm.; met., 4 mm.

Male.—For structure of palpus see Pl. XX, figs. 1, 3.

Total length, 8 mm. Length of cephalothorax, 3.9 mm.; width, 3 mm.

Length of leg I, 10.6 mm.; tib. + pat., 3.9 mm.; met., 2.3 mm.

Length of leg II, 10.2 mm.

Length of leg III, 9.9 mm.

Length of leg IV, 11.3 mm.; tib. + pat., 4.3 mm.; met., 2.3 mm.

Syn.—1892. *Lycosa rufiventris* Banks, Proc. Acad. Nat. Sci. Phila., p. 65, Pl. 3, fig. 35.

1895. *Lycosa rufiventris* Banks, J. N. Y. E. Soc., 3, p. 91.

1903. *Lycosa avara*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 650, Pl. XXIX, fig. 2.

1904. *Trochosa avara*, Montgomery, *ibid.*, p. 304, Pl. XX, fig. 42.

Known localities.—Massachusetts, New York!, Texas!, Kansas!, Iowa!.

Var. *gosiuta*, new.

Females from Utah thus far seen differ a little from the type form in the shape of the epigynum. The blunt process at distal end of guide in *avara* proper is absent in this variety, and the lateral ends of the transverse arms extend forward beyond the middle of the foveæ (Pl. XX, fig. 4).

Locality.—Utah!.

Lycosa cinerea (Fab.), 1793.

(Sub *Araneus*, Ent. Syst., II, p. 423.)

Female.—*Cephalothorax* with the tegument marked with a broad median band which is wider than the eye area and covers clypeus in front; this band constricted back of eye area and again, more strongly, at posterior limit of pars cephalica, back of which its edges are irregular or toothed, and widening triangularly down the posterior declivity, across the lower border of which it is united with the broad lateral bands of the same color; the pale lateral bands extending forward only to the pars cephalica, with upper margin toothed; except for these light bands the cephalothorax is dark chocolate-brown; in life the cephalothorax is densely covered with white and gray hair intermixed in spots and streaks, radiating more or less from the dorsum laterally. *Chelicerae*

black, clothed with gray or grayish-brown hair. *Legs* with clear brown tegument which is itself faintly annulate, the clothing of white hair making the annulation much more distinct. The *abdomen* having on dorsum a median gray band which is margined on each side anteriorly with a black stripe, continued posteriorly by a row of black dots which in life are ocellate with central patches of white hair; the median light band enclosing anteriorly a hastate outline which is open anteriorly and is bifurcate behind; sides of abdomen white spotted with black; venter white in life, but the tegument denuded of hair commonly shows a smoky band from genital furrow to spinnerets. *Spinnerets* brown. *Coxæ* and *sternum* brown, the latter dusky marginally. *Labium* brownish black. *Endites* brown. The general color effect of this species in life is that of a dusky-white body marked with small spots and streaks of gray and black.

Cephalothorax highest at middle of *pars cephalica* some distance back of third eye row. The third eyes upon a plane strongly sloped antero-ventrally, the face more strongly slanting. First *eye* row of about same length as the second.

For structure of *epigynum* see Pl. XX, fig. 6.

Total length, 11.5 mm. Length of cephalothorax, 6.2 mm.; width, 4.8 mm.

Length of leg I, 13.8 mm.; tib. + pat., 4.8 mm.; met., 3 mm.

Length of leg II, 12.7 mm.

Length of leg III, 12 mm.

Length of leg IV, 17 mm.; tib. + pat., 5.5 mm.; met., 4.2 mm.

Male.—Coloration as in female or nearly so. For structure of palpal organ see Pl. XX, fig. 5. A specimen gave the following measurements:

Total length, 9.8 mm. Length of cephalothorax, 5.1 mm.; width, 4 mm.

Length of leg I, 12.5 mm.; tib. + pat., 4 mm.; met., 3 mm.

Length of leg II, 11.4 mm.

Length of leg III, 11 mm.

Length of leg IV, 14.7 mm.; tib. + pat., 4.8 mm.; met., 4 mm.

Syn.—1831. *Lycosa lynx* Hahn, Die Arachn., II, p. 13, fig. 194.

1841. *Lycosa maritima* Hentz.

1848. *Lycosa halodroma* C. Koch, Die Arachn., V, p. 196, figs. 410, 411.

— *Arctosa cinerea* C. Koch, *ibid.*, XIV, p. 123, fig. 1358.

— *Arctosa lynx* C. Koch, *ibid.*, p. 133, fig. 1364.

1875. *Lycosa maritima* Hentz, Spiders U. S., ed. Burgess.

1885. *Lycosa cinerea*, Emerton, New England Lycos., Tr. Conn. Acad. Sci., VI, p. 488, Pl. 47, fig. 3.

1839. *Trochosa cinerea* Marx, Proc. U. S. N. M., p. 564.

1902. *Lycosa cinerea* Emerton, Common Sp. U. S.

———. *Lycosa cinerea* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 555, Pl. XXIX, figs. 17, 18.

1904. *Trochosa cinerea*, Montgomery, *ibid.*, p. 305, Pl. XX, fig. 43.

Type locality.—Europe.

Known localities.—Massachusetts, Connecticut, Indiana, New Jersey, New York (Long Island!), South Carolina, Utah!, Arizona, New Mexico, Texas.

A common form along the Atlantic seashore. Its color of dirty white finely marked with streaks and spots of gray and black harmonizes with that of the sand over which it runs.

Lycosa floridiana (Banks).

(Sub *Trochosa*, Tr. Am. Ent. Soc., Vol. XXIII, p. 72.)

Female.—*Cephalothorax* with a broad median yellow stripe wider than the eye area in front, and narrowing gradually caudally; eye region black, the clypeus either entirely black or paler across margin; sides of cephalothorax brown. *Chelicerae* yellow to dark brown. *Labium* black. *Endites* brown. *Sternum* and *coxae* of legs beneath light brown or yellow. *Legs* light brown or yellow proximally, with a tendency to become darker, smoky or blackish, distally. *Abdomen* pale mesally above from anterior end to spinnerets, a faint lanceolate outline in basal part; a black spot over each antero-lateral angle, followed or not with a number of other dark spots so as to form a dark border each side of dorsum; venter and lower portion of sides immaculate.

Face low, strongly slanting outward, evenly convexly rounded laterally.

First row of eyes a little shorter than the second, weakly procurved, anterior median eyes larger than the lateral, considerably closer to the lateral than to each other.

Epigynum wider than long; septum wide anteriorly, evenly arched ventrally; foveae oval, obliquely and well caudally placed, suggesting an approach to the *Allocosa* type.

Total length, 7 mm. Length of cephalothorax, 3.2 mm.; width, 2.2 mm.

Length of leg I, 6.8 mm.; tib. + pat., 2.5 mm.; tarsus, 1 mm.

Length of leg II, 6.4 mm.

Length of leg III, 6.2 mm.

Length of leg IV, 7.8 mm.; tib. + pat., 3 mm.; tarsus, 1.2 mm.

Locality.—Florida.

The genus **ALLOCOSA** Banks, 1900.

(Proc. Acad. Nat. Sci. Phila., p. 537.)

Cephalothorax glabrous or nearly so to sparsely pubescent. Anterior tibiae armed beneath with three pairs of *spines*, of which the third pair is apical in position and all of which are moderate to minute in size, either armed or unarmed laterally. Anterior row of *eyes* straight to a little procurved, from longer to shorter than the second row; anterior median eyes larger than the lateral, more or less; clypeus narrow, at most as wide as the diameter of an anterior lateral eye; eyes of second row of moderate size, much less than their diameter apart; quadrangle of posterior eyes trapeziform, wider behind than in front. *Labium* longer than wide, well attenuated anteriorly; basal excavation short, about one-fourth the total length. *Spinnerets* very short, anterior and posterior pairs subequal in length. *Epigynum* simple, presenting no true guide, or but weakly furrowed, the spermatheca opening free posteriorly. Bulb of *male palpus* bearing a scopus which is exterior in position.

- 1842. *Lycosa* Hentz (ad. part. *funerea*), J. Bost. Soc. Nat. Hist., 4, p. 228-299.
- 1875. *Lycosa* Hentz (ad. part. *funerea*), Sp. U. S., p. 24.
- 1876. *Lycosa* Keyserling (ad. part. *rugosa*), Verh. z. b. Ges. Wien. pp. 610-624.
- 1888. ? *Tricca* Simon, Ann. Ent. Soc. Fr., p. 250.
- 1890. *Lycosa* Marx (ad. part. *funerea* and *rugosa*), Proc. U. S. N. M., p. 12.
- 1890. *Pardosa* Stone (ad. part. *nigra*), Proc. Acad. Nat. Sci. Phila., 42, p. 432.
- 1894. *Trochosa*, Banks (ad. part. *parva*), J. N. Y. E. Soc., p. 52.
- 1898. *Lycosa* Simon (ad. part.), Hist. Nat. Aragn., 2.
- . *Aulonia* (?) Banks, Proc. Cal. Acad. Sci., p. 273.
- 1904. *Allocosa* Banks, Journ. N. Y. Ent. Soc., p. 113.

Cephalothorax arched convexly behind, strongly attenuated anteriorly; pars cephalica narrow and inclined anteriorly, rather low; face with sides convex and sloping outward from above below; posterior eyes seen from above well removed from sides of pars cephalica. General appearance of cephalothorax much like that of a Drassid. In the known species the cephalothorax is entirely without distinct pale stripes, or with a median paler band weakly contrasting.

Chelicerae rather weak; lower margin of furrow armed with three teeth, the superior with two. *Legs* short; posterior tarsi simply setose, and the anterior either entirely setose or with sparse lines of scopular hairs at the sides.

Excepting as to curvature of the anterior row of eyes, this genus is much like most species of Simon's old genus *Tricca*, now withdrawn by its author into *Lycosa*. It has the same form of cephalothorax

and shows the same tendency toward excessive reduction of the spines of the anterior legs, these spines in some species of *Tricca* being entirely absent from the tibiæ (cf. *degesta*, *infra*). In *Tricca* the anterior row of eyes is always more or less recurved, while in *Allocosa* it is at most straight. This difference may prove not to hold good. It may become impossible ultimately to maintain this group separate from *Lycosa*, the American species of which it closely approaches through the *Trochosa* group.

KEY TO SPECIES OF ALLOCOSA.

1. All joints of legs except femora clear yellow, without any darker annulations or markings except at ends of tibiæ IV,
rugosa (Keys.).
 Legs beyond femora more or less distinctly annulate with dark, 2.
2. Anterior row of eyes longer than the second; anterior median eyes not more than one-fifth their diameter apart; anterior tibiæ armed neither in front nor behind, and the ventral spines minute,
degesta Chamb.
 Anterior row of eyes shorter than the second; anterior median eyes their radius or nearly so apart; anterior tibiæ armed in front and behind and the ventral spines longer, 3.
3. Femora of first legs solid black above, a sub-basal brown band on the others, *funerea* (Hentz).
 Femora of first legs not solid black, marked with three black rings, 4.
4. First pair of ventral spines of anterior tibiæ reaching the bases of the median pair, the basal spines in length equalling the diameter of the joint; upper margin of furrow of chelicera with three teeth,
parva (Bks.).
 First pair of ventral spines of anterior tibiæ not reaching bases of median pair; and none of the spines in length equalling the diameter of the joint; upper margin of furrow of chelicera with two teeth, *evagata*, sp. n.

Allocosa rugosa (Keyserling), 1876.

(Verh. z. b. Ges. Wien, 26, p. 624, Pl. 7, figs. 9, 10.)

Female.—*Cephalothorax* shining black with obscure brown lines radiating from above; sometimes with a brownish luster; clypeus a little paler, brownish. *Chelicerae* black. *Labium*, *endites* and *coxae* of legs beneath brown. *Sternum* brownish black. *Legs* with all femora black, all other joints yellow or pale brown, except the posterior tibiæ which have a dark ring at each end. *Abdomen* with front declivity and the sides blackish with some minute lighter dots; dorsum obscure brown, black lines outlining a lanceolate mark at base which is continued behind as a fine black median line with a row of black dots

on each side of it; outside these more median marks is on each side a straight row of black spots which are in part confluent; sides of dorsum with obscure irregular dark markings; venter brown. *Spinnerets* and *epigynum* brown.

Chelicerae one and one-third times as long as the *face* is high; sides of face convex and bulging outward below. *Cephalothorax* with its dorsal line in profile convex, not much descending posteriorly and not concavated at middle.

Anterior row of *eyes* shorter than the second, distinctly procurved; anterior median eyes, oval and diverging, their radius apart, hardly half so far from the lateral eyes which are a little smaller, about half their diameter from eyes of second row; anterior lateral eyes less than their diameter (about two-thirds) from front margin of clypeus, a little farther from eyes of second row; eyes of second row comparatively low on face, a little more than half their diameter apart; cephalothorax about 4.5 times as long as the quadrangle of posterior eyes.

Epigynum nearly as in the next species (*funerea*), but the median part or lobe more convex.

Total length, 5.6 mm. Length of cephalothorax, 2.6 mm.; width, 1.9 mm.

Length of leg I, 5.5 mm.; tib. + pat., 1.9 mm.; met., 1.2 mm.

Length of leg II, 4.9 mm.

Length of leg III, 4.9 mm.

Length of leg IV, 7.8 mm.; tib. + pat., 2.4 mm.; met., 2.3 mm

Male.—*Coloration* as in female excepting palpi which are entirely black.

Patella of *palpi* as long as or a little longer than the tibia which thickens distally and, seen from above, is some thicker than the preceding joint; tarsus relatively narrow, not much broader than the tibia, its apical part bent ventrad. For palpal organ see Pl. XXIII, fig. 3.

Total length, 4.5 mm. Length of cephalothorax, 2.4 mm.; width, 1.8 mm.

Length of leg I, 5.2 mm.; tib. + pat., 2 mm.; met., 1 mm.

Length of leg II, 4.7 mm.

Length of leg III, 4.5 mm.

Length of leg IV, 7.5 mm.; tib. + pat., 2.7 mm.; met., 2 mm.

Syn.—1890. *Pardosa nigra* Stone, Proc. Acad. Nat. Sci. Phila., Vol. 42, p. 432, Pl. XV, figs. 4, 4a.

Non. syn.—1891. *Lycosa funerea* Banks, Ent. News.

Syn.—1902. *Lycosa nigra*, Montgomery, *op. cit.*, p. 538, Pl. 29, fig. 1.

1904. *Lycosa nigra*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 285, Pl. XX, figs. 40, 41.

Type locality.—Maryland (Baltimore).

Known localities.—Maryland, Pennsylvania, District of Columbia!

Allocosa funerea (Hentz), 1842.

(Sub *Lycosa*, Proc. Bost. Soc. Nat. Hist., 4, p. 393.)

Female.—*Cephalothorax* shining reddish black becoming a little paler above, the marginal lines deep black; clypeus pale. *Chelicerae* deep reddish brown. *Labium* and *endites* brown. *Sternum* dark brown, blackish at borders. *Coxae* of legs yellowish brown. *Legs* with ground color brown of reddish tinge; femora of first pair of legs black, the succeeding femora similar but pale beneath and with the black divided above the proximal end by a brownish cross-band, this annulus becoming more distinct on the posterior legs, and the extreme distal end of all femora pale; all tibiae with a subbasal and a subapical ring of black; metatarsi less distinctly annulate, there being a median annulus, often more or less diffused, and on posterior pairs also a subbasal and a subapical band. *Abdomen* appearing black above and at sides, minutely dotted with yellow; the dorsum in front paler, reddish yellow, the paler area enclosing a lanceolate black-margined outline, and followed behind by a row of light spots with black dots at center on each side, these being connected in pairs by black angular cross-lines the angles of which are directed backward; opposed to the black cross-lines is a series of light chevron-lines with angles forward; venter pale brown, immaculate or sometimes with a few short transverse marks along each side.

Form of *cephalothorax* and *face* much as in *rugosa*.

Anterior row of *eyes* a little shorter than the second, gently procurved; anterior median eyes their radius or a little more apart, closer to the lateral eyes which are but slightly smaller, less than their radius from eyes of second row; anterior lateral eyes less than their diameter from eyes of second row; eyes of second row their radius apart, rather less than more; quadrangle of posterior eyes as wide in front as long, the cephalothorax 5.5 times longer; eyes of third row unusually small. *Labium* longer than wide (5.3 : 4.8); basal excavation one-fourth total length; sides slightly convex, strongly converging distally; front margin convexly rounded, more rarely straight.

For spines of anterior tibiae see Pl. X, fig. 3.

The *epigynum* nearly identical in form with that of *A. degesta* (Pl. XXIII, fig. 5).

Total length, 5.2 mm. Length of cephalothorax, 2.7 mm.; width, 2 mm.

Length of leg I, 6 mm.; tib. + pat., 2 mm.; met., 1.2 mm.

Length of leg II, 5.7 mm.

Length of leg III, 5.3 mm.

Length of leg IV, 8.25 mm.; tib. + pat., 2.5 mm.; met., 2.4 mm.

Syn.—1875. *Lycosa funerea* Hentz, J. Bost. Soc. Nat. Hist., 4, p. 393.

1890. *Lycosa funerea*, Marx, Proc. U. S. N. M., 12.

1897. *Lycosa funerea*, Banks, Proc. Ent. Soc. W., 4.

1902. *Lycosa sublata* Montgomery, Proc. Acad. Nat. Sci. Phila., 539.

1904. *Trochosa sublata*, Montgomery, *ibid.*, p. 308.

Type locality.—Alabama.

Known localities.—Alabama, Georgia!, Louisiana!.

"This species abounds on the ground. It has the habits of a *Herpyllus*, and runs with great rapidity" (Hentz).

Allocosa degesta Chamberlin, 1904.

(Can. Entomologist, p. 287.)

Female.—*Cephalothorax* shining black of reddish luster. *Chelicerae* the same. *Labium* and *endites* brown. *Legs* nearly as in *funerea*, but light marks on *femora* more obscure and less contrast on other joints between the light and dark rings. *Sternum* reddish brown, dark about margins, lighter, more yellowish, over middle area. *Abdomen* above nearly as in *funerea*; venter yellow with a few faint dark dots at sides. *Spinnerets* yellow. *Epigynum* brown, weakly reddish at borders.

Chelicerae nearly twice as long as the *face* is high. Anterior row of eyes a little longer than the second, nearly straight, anterior median eyes much larger than the lateral (at least 3 : 2), at most one-fifth their diameter apart, still closer to the lateral eyes, not fully one-third their diameter from eyes of second row; anterior lateral eyes not fully their diameter from front margin of clypeus, some closer to eyes of second row; anterior median eyes three-fourths as large as those of second row (Pl. X, fig. 2); eyes of second row about their radius apart; quadrangle of posterior eyes as wide in front as long, only one-sixth as long as cephalothorax. *Spines* of anterior tibiae greatly reduced, minute, none at all on either anterior or posterior side of joint (Pl. X, fig. 1).

Epigynum nearly the same as that of *funerea* (Pl. XXIII, fig. 5).

Total length, 6.6 mm. Length of cephalothorax, 3.2 mm.; width, 2.25 mm.

Length of leg I, 7.2 mm.; tib. + pat., 2.5 mm.; met., 1.6 mm.

Length of leg II, 6.3 mm.

Length of leg III, 6.3 mm.

Length of leg IV, 9.4 mm.; tib. + pat., 3 mm.; met., 2.8 mm.

Syn.—1904. ?*Trochosa noctuabunda*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 301.

Locality.—Louisiana.

One mature and one immature female collected at Baton Rouge by Mr. B. H. Guilbeaux.

Alloosia parva (Banks), 1894.

(Sub *Trochosa*, J. N. Y. Ent. Soc., II, p. 52.)

Male.—*Cephalothorax* with a wide paler median band, anteriorly wider than eye area; eye region blackish; sides deep brown to shining black; a row of indistinct dots on each side; the paler band clothed with sparse gray pubescence, especially anteriorly; dark parts with sparse gray and brown hairs intermixed; tending to be glabrous except about eyes and face. *Chelicerae* reddish brown. *Labium* and *endites* brown. *Sternum* blackish, brown at middle and along sides clothed with gray pubescence and long blackish bristles. *Coxae* of legs beneath yellow. *Legs* yellow with distinct black rings on all joints except tarsi. *Abdomen* above grayish or yellowish gray, being clothed with light gray and some yellow hair; dorsum at base with a black lanceolate outline and behind with a number of black chevron-shaped marks and also laterally with some dark spots; venter gray, immaculate. *Spinnerets* brown. *Palpi* brown, not ringed, the tarsi darker than other joints.

Cephalothorax wide behind and much narrowed anteriorly, being only about one-half as wide across eyes as behind. *Face* with sides convex and slanting, in height one-half the length of the *chelicerae*; in profile dorsal line is seen to be highest near third eye row, and gently convex between eyes and posterior declivity.

Anterior row of *eyes* slightly procurved, as long as the second row; anterior median eyes clearly larger than the lateral, more than their radius apart, close to lateral eyes; anterior lateral eyes their diameter from front margin of clypeus and from eyes of second row; eyes of second row not large, nearly their diameter apart; quadrangle of posterior eyes one-fifth the length of cephalothorax.

Tarsi and metatarsi of the first and second pairs of *legs* scopulate as usual; tarsi of the third and fourth pairs setose, not at all scopulate; patella of second legs armed in front with a single spine; tibia + patella of fourth legs a little shorter than cephalothorax, longer than metatarsi of fourth leg; patella of third leg of about the same length as the

tibia; metatarsus of first leg longer than tibia of first; femur of fourth leg about same length as width of cephalothorax.

Patella of *palpus* clearly longer than the tibia; tarsus not fully as long as the tibia + patella.

For structure of palpal organ see Pl. XX, fig. 7.

Total length, 6 mm. Length of cephalothorax, 3 mm.; width, 2.1 mm.

Length of leg I, 6.5 mm.; tib. + pat., 2.1 mm.; met., 1.4 mm.

Length of leg II, 5.8 mm.

Length of leg III, 6.1 mm.

Length of leg IV, 8.4 mm.; tib. + pat., 2.8 mm.; met., 2.3 mm.

Female.—Coloration similar to that of male.

Epi gynum of general type of that of *funerea*, but epigynal plate more elongate and more strongly narrowed at posterior end; with posterior margin concave or indented mesally, not bowed caudally.

Total length, 8.5 mm. Length of cephalothorax, 3.4 mm.; width, 2.7 mm.

Length of leg IV, 9.7 mm.; tib. + pat., 3.1 mm.; met., 2.8 mm.

1895. *Trochosa parva* Banks, Ann. N. Y. Acad. Sci., Vol. VIII, p. 430.

1901. *Trochosa parva*, Banks, Proc. Acad. Nat. Sci. Phila., p. 587.

1902. *Trochosa parva*, Banks, Proc. U. S. N. M., p. 217.

Type locality.—Colorado.

Known localities.—Colorado!, Arizona, New Mexico!, Utah!.

***Allocosa evagata* sp. nov.**

Female.—*Cephalothorax* blackish brown; rather paler above; on each side a marginal line of clear black; in front of dorsal furrow a faint polygonal figure outlined in black, with an angle in middle of front margin produced toward eye region as a line and a similar one on each side produced obliquely along side of *pars cephalica*; the cephalothorax rather paler in front of this figure than elsewhere; color deeper about eyes. *Chelicerae* reddish brown, an indistinct blackish mark across middle which mesally continues obliquely upward on inner face. *Legs* yellow with distinct dark rings of which there are three on the femora, the apical one being about twice as broad as the others; these rings incomplete above but continuous laterally and ventrally. The second and third rings on femora IV are confluent along the antero-dorsal side. The tibiae each with two dark rings, of which at least the distal one is interrupted above. The metatarsi with three indistinct rings. *Labium*, *endites*, *coxae* and *sternum* yellow, the labium and sternum dusky. Front part of dorsum of abdomen obscure reddish

yellow, this area embracing some small, ill-defined dark dots. Posteriorly are pairs of ocellate light spots which are united transversely by inverse chevron-lines, between which are indicated pale chevron-lines with the apices directed forward. The dorsum elsewhere and the sides covered with a dense network of black over the obscure yellow background, *i.e.*, appearing black marked with numerous small dots of yellow. Venter yellow with some short transverse marks of dark color toward the sides. *Epigynum* reddish yellow. *Spinnerets* yellow.

First row of *eyes* evidently shorter than the second. Anterior median eyes larger than the lateral (4 : 3), at most their radius apart, half as far from the lateral eyes. Anterior lateral eyes a little less than their diameter from front margin of clypeus, two-thirds their diameter from eyes of second row. Eyes of second row two-thirds their diameter apart. Dorsal eye area of same length as the width in front which is but little less than that behind, the area being subquadrate. Dorsal eye area one-fourth as long as the cephalothorax.

Legs of but moderate length. Tibia + patella IV shorter than the cephalothorax, longer than the metatarsus. Metatarsus IV some longer than tibia + patella of leg I. Spines of anterior tibiae rather short, slender and prone. None of the tarsi truly scopulate, sparsely clothed with bristles of ordinary form.

Lower margin of furrow of *chelicerae* with three teeth as in *Lycosa*, the teeth conical and well spaced, the median one being largest. The upper margin with but two teeth which are stout and conical, the first being larger than the second and also larger than those of the lower margin which are of about same size as the second one above.

Labium attenuated anteriorly, its front margin concave.

For structure of *epigynum* see Pl. XXIII, fig. 4.

Total length, 5.2 mm. Length of cephalothorax, 2.8 mm.; width, 2 mm.

Length of leg I, 6.1 mm.; tib. + pat., 2 mm.; met., 1.3 mm.

Length of leg II, 5.8 mm.

Length of leg III, 5.8 mm.

Length of leg IV, 7.5 mm.; tib. + pat., 2.5 mm.; met., 2.2 mm.

Syn.—1898. *Aulonia*(?) *funerea* Banks, Proc. Cal. Acad. Sci., p. 273.

Locality.—Baja California.

Described from a specimen loaned by California Academy of Sciences and bearing label by Banks of *Aulonia*(?) *funerea* Htz.

While not yet reported actually from within our borders, the form will doubtless be found to occur in the Southwest and is therefore included.

(?) *Allocosa exalbida* L. Becker, 1881.

(*Loc. sup. cit.*, figs. 3, 3a, 3b.)

Only figures were published. A pale species about 11 mm. long, with very long legs. The figure of the eyes would seem certainly to prove this species not to be a *Lycosa*. The epigynum is not that either of *Lycosa* or a *Pardosa*, being like that of some *Piratas* and much like that of *Allocosa* (*funerea*).

The eyes also resemble those of this latter genus, but this form is placed here with much doubt.

Locality.—New Orleans.

The genus **SOSIPPUS** E. Simon, 1888.

(*Ann. Ent. Soc. Fr.*, p. 205.)

Entire body densely clothed with rather long *pubescence*. Anterior *tibiae* armed beneath with three pairs of spines which are basal, median or submedian, and apical in position respectively; these spines long and apically slender and aculeate, much longer than the diameter of the joint (Pl. XI, fig. 4). Anterior *eyes* well separated, equidistant or very nearly so; the lateral ones on protruding tubercles, as large as or (as in ours) larger than the median; the anterior row longer than the second (Pl. XI, fig. 2); clypeus as wide as the diameter of an anterior lateral eye; eyes of second row considerably less than their diameter apart; quadrangle of posterior eyes trapeziform, distinctly broader behind than in front. *Chelicerae* armed below with four stout conical teeth. *Labium* longer than wide, the basal excavation (in ours) one-third the total length. Posterior *spinnerets* distinctly and considerably longer than the anterior, the second joint of the former being long and conical (Pl. XI, fig. 5). *Epigynum* with a guide which in the known species is subclavately enlarged distally (Pl. XXIII, fig. 2). Alveolar area of male *palpus* comparatively small; a simple (in ours) process from basal lobe present in an exterior position, extending distally and free except at base; no pit or fold at base of process (Pl. XXIII, fig. 1).

Syn.—1898. *Sosippus* Simon, *Hist. Nat. Araign.*, 2, p. 326.

1902. *Sosippus* Cambridge, *Boil. Cent. Amer.*, pp. 315–332.

1903. Comstock, *Classif. of N. A. Spiders*.

Cephalothorax long and rather low, the pars cephalica not elevated. *Face* rounded forward to the front eye row, the clypeus from above below more or less retro-oblique, its sides convex and slanting outward (Pl. XI, fig. 4). Quadrangle of posterior *eyes* one-fifth as long as

the cephalothorax. *Cheliceræ* long and robust, the upper margin armed as usual with three teeth of which the median one is much stoutest; in the armature of the lower margin of the furrow with four stout teeth the genus resembles *Dolomedes*; the statement made by Simon that the two middle teeth of the lower margin are longer than the others does not hold for *S. floridanus*, in which the fourth tooth is distinctly longest; in immature specimens sometimes but three teeth are present on the lower margin. *Legs* with the tarsi and metatarsi densely and widely scopulate for their entire lengths from base to apex, the scopulæ long; the scopulæ of the posterior pairs divided by a median narrow line of bristles; distal joints of legs with long aculeate bristles.

Spiders of large size, in general appearance similar to *Lycosa*. In the character of the mouth parts they suggest some of the *Pisauridæ*. In the structure of the spinnerets and in the color markings of the abdomen and especially in habits they show close affinities with the *Agelenidæ*. The habits of the species of this genus so far as observed are very similar to those of *Hippasa* and *Porrina*, the two most closely related genera. The three genera are all composed of species which are sedentary in habit, building large webs of fine silk with a central funnel-shaped tubular retreat, precisely as do the *Agelenas* and other *Agelenidæ*. In rushing out to seize their entangled prey they run upon the lower surface of the web. Like other *Lycosidæ*, however, they suspend their cocoons to the spinnerets where they are maintained constantly, never depositing them upon the web. They do not desert their webs during the cocooning season. According to Cambridge, the movements of a *Sosippus* which he observed upon the Amazon were exceedingly quick, like those of *Agelena*.

Sosippus is known only from the Americas, having been found in Florida, Lower California, Mexico, Central America and Brazil. But one species occurs within our limits.

***Sosippus floridanus* Simon.**

Female.—*Cephalothorax* deep reddish brown or reddish black without distinct light markings in the tegument; behind the eye region a median stripe of yellow hair and on each side a wider marginal band of white hair intermixed anteriorly with some of yellow color, these marginal bands extending forward to the clypeus but not joining across it; pubescence elsewhere dark. *Cheliceræ* shining black sparsely clothed above with blackish hair and densely clothed below with grayish-brown hair of which there is a fringe along the furrow. *Labium* and *endites* rather dark reddish brown, paler distally. *Sternum* red-

dish-brown, the *coxæ* of legs a little paler and less reddish, clothed with cinereous hair intermixed with longer brown bristles. *Legs* fuscous, varied with some reddish-brown lines and marks, the femora darker than the other joints clothed with brown and cinereous pubescence. *Abdomen* blackish above, the venter brown; on each side of dorsum a row of spots of white hair and the median part of dorsum behind crossed by narrow white lines similarly formed by pubescence; outer part of dorsum and sides densely covered with minute spots and streaks of white hair; venter densely clothed with brown and cinereous hair, two darker lines converging from the epigynum backward and uniting before attaining the spinnerets, these lines being covered with the dark hair unmixed.

Face with the sides convex and widely slanting, in height only about half as great as the length of the chelicerae.

Anterior row of *eyes* clearly longer than the second, rather strongly procurved; anterior median eyes some less than their diameter apart, and less than their diameter from eyes of second row; anterior lateral eyes a little larger than the median, their tubercles prominent, their diameter from front margin of clypeus, fully one and one-third their diameter from eyes of second row; eyes of second row large, two-thirds their diameter apart; quadrangle of posterior eyes half again as wide behind as in front, a little more than one-fifth the length of the cephalothorax (4.8 : 1). Lower margin of furrow of *chelicerae* with the teeth nearly equidistant, the fourth evidently largest. *Labium* but slightly longer than broad (13 : 12.8); basal excavation one-third length of labium; sides below hardly converging, but above strongly rounding and converging; front margin very slightly widely concavate to straight (Pl. XI, fig. 1). *Legs* with tibiae armed as described under the genus, the two basal pairs long and slender, apically bristle-like, the apical pair stout and abruptly pointed (Pl. XI, fig. 4); tarsi, metatarsi and distal part of tibiae I and II densely scopulate, the posterior ones differing as usual. For spinnerets see Pl. XI, fig. 5.

For the structure of the *epigynum* see Pl. XXIII, fig. 2.

Total length, 14.2 mm. Length of cephalothorax, 7 mm.; width, 5 mm.

Length of leg I, 17.8 mm.; tib. + pat., 6.1 mm.; met., 4 mm.

Length of leg II, 16 mm.

Length of leg III, 15.5 mm.

Length of leg IV, 22.9 mm.; tib. + pat., 7 mm.; met., 6.2 mm.

Male.—*Coloration* as in the female, or a little lighter; palpus clothed with fulvo-cinereous pubescence.

Tibia of *palpus* longer than the patella, the tarsus nearly equalling the combined length of the two preceding joints; tarsus much wider than the tibia (3 : 2). For structure of the palpal organ see Pl. XXIII, fig. 1.

Total length, 11.2 mm. Length of cephalothorax, 6 mm.; width, 4.2 mm.

Length of leg I, 18.5 mm.; tib. + pat., 6.3 mm.; met., 4 mm.

Length of leg II, 18 mm.

Length of leg III, 17.8 mm.

Length of leg IV, 23.7 mm.; tib. + pat., 7.1 mm.; met., 7 mm.

Locality.—Florida!.

The female described above is one of the type specimens.

The genus **TRABEA** Simon, 1876.

(Arachn. Fr., 3, p. 356.)

Anterior tibiae and metatarsi armed beneath with very long *spines* which are much longer than the diameter of the joint; of these spines there are on the tibiae three or four pairs (Pl. XII, fig. 2). Anterior *eyes* in a very strongly procurved row which is shorter than the second; anterior median eyes much closer to each other than to the lateral which are but little or sometimes not at all smaller; clypeus narrow, the anterior lateral eyes being separated from its front margin by their diameter or but little more, always farther from the eyes of second row; eyes of second row at upper exterior angles of face, strongly convex and protruding, less than their diameter apart; eyes of third row likewise strongly convex, divergent, facing outward and backward, quadrangle of posterior eyes but little wider behind than in front. *Labium* wide, attenuated anteriorly, the basal excavation short. Posterior *spinnerets* (at least in ours) evidently longer than the anterior, the second joint distinct though not long. *Epigynum* with a guide; in ours, strongly chitinized only on each side about the spermathecal openings, elsewhere less dense, clothed with hair as tegument elsewhere. Male palpus bearing a *scopus* in a median position; basal spur extremely large, much longer than the erect branch (in ours).

Syn.—1885. *Aulonia* Emerton (*A. aurantiaca*), Tr. Conn. Acad. Sci., 6, p. 498.

1898. *Trabæa* Simon, Hist. Nat. Araign., 2, p. 349.

1903. *Trabæa* Comstock, Classification of North American Spiders.

Pars cephalica long, but little inclined anteriorly. Sides of *face* straight and vertical or nearly so; face protruding above over its basal portion (Pl. XII, fig. 1). Quadrangle of posterior *eyes* relatively

long. Posterior eyes seen from above touching or protruding beyond the lateral margins of pars cephalica (Pl. XI, fig. 8). *Cheliceræ* with the lower margin armed either with two or with three teeth, the upper with three. *Legs* rather long; tarsi either very sparsely scopulate on anterior pairs or the scopulæ quite absent.

Spiders of small size, readily distinguished by the extreme convexity of the eyes of the second and third rows and by the strongly procurved first row with its median eyes closer to each other than to the lateral. The very long straight spines of the anterior legs form a prominent feature. The quadrangle of posterior eyes is relatively much longer than in any other known North American *Lycosidæ*.

Trabea aurantiaca (Emerton), 1885.

(Trans. Conn. Acad. Sci., 6, p. 499, Pl. 49, figs. 6 to 6b.)

Female.—Sides of *cephalothorax* black or blackish brown; a bright yellow supramarginal band on each side extending forward to the clypeus and touching the inferior edges of eyes of second and third rows; a yellow median band nearly as wide as third eye row just behind the latter, extending broadly between the third eyes nearly to those of second row, posteriorly rapidly narrowing to a point at the dorsal groove over which it is obscure or absent, becoming again visible on the posterior declivity on which it begins above at a point and widens clavately downward to the posterior margin; eyes surrounded by black; clypeus yellow. *Cheliceræ* smoky brown or blackish above, yellowish distally. *Labium* and *endites* brown, often dusky, pale distally. *Sternum* and *coxae* of legs yellow to brown. *Legs* with background yellow; femur I black; femur II like I, but with the black more or less broken by yellow, especially so above; the posterior femora more largely yellow, the black marks often faint; patellæ dark or black distally; tibiæ with a basal and an apical dark ring, and the metatarsi more or less darkened at proximal end; the markings of all these joints becoming more indistinct or disappearing on the posterior pairs, the last pair being often clear bright yellow. *Abdomen* orange-brown, the sides marked by a series of parallel black bars which pass obliquely downward and caudad, the most anterior of which on each side bends forward across the corresponding antero-lateral angle; these black bars connected at upper ends on each side by narrow angular lines with angles directed mesad; these angles, excepting the first, are connected into pairs by black chevron-lines across dorsum; anterior area of dorsum showing more indistinctly a lanceolate figure outlined by a fine black line; venter unmarked except for a narrow inwardly

bending dark line each side of middle, the two of which are united by a cross-bar just at base of spinnerets. *Spinnerets* dusky orange. *Epigynum* reddish brown about spermathecal openings, elsewhere concolorous with the venter.

Pars cephalica long and high, highest anteriorly and visibly descending caudad to the *pars thoracica*. *Chelicerae* a little longer than height of *face*. Anterior row of *eyes* as described for genus; anterior median eyes two-thirds their diameter apart, fully their diameter from the lateral eyes which are about two-thirds as large, their diameter from eyes of second row; anterior lateral eyes their diameter or some less from front margin of clypeus, one and one-half times their diameter from eyes of second row; quadrangle of posterior eyes one-third or more the length of the cephalothorax (Pl. XI, fig. 8). Lower margin of the furrow of *chelicerae* armed with two stout conical teeth which are subequal; upper margin with three teeth of usual character. *Labium* clearly wider than long (5 : 4); the basal excavation little or not at all more than one-fifth the total length; sides strongly converging anteriorly; front margin truncate or slightly convexly rounded. *Legs* having tarsi bent or curved down at distal end but not at base as in male; tarsi sparsely setose and scopulae entirely absent. Posterior *spinnerets* widely separated; distinctly longer than the anterior, but in alcohol often bent toward each other and then inconspicuous; the second joint distinct but short, bluntly pointed.

For form of *epigynum* see Pl. XII, fig. 2.

Total length, 3.4 mm. Length of cephalothorax, 1.6 mm.; width, 1 mm.

Length of leg I, 4 mm.; tib. + pat., 1.4 mm.; met., .95 mm.

Length of leg II, 3.8 mm.

Length of leg III, 3.8 mm.

Length of leg IV, 5.5 mm.; tib. + pat., 1.7 mm.; met., 1.5 mm.

Male.—Lighter than female, markings of legs (excepting the anterior femora) and of abdomen less distinct or absent. *Palpi* black; the tip of tarsus yellow, in life clothed, like legs, with white hair

All tarsi of *legs* distinctly curved downward distally, the anterior ones strongly so, those of the third and fourth pairs also bent at proximal end. *Palpus* with the sides of tibiae parallel, not at all enlarged distally; tibia longer than patella by one-fourth its length; tarsus of about same length as tibia + patella, much wider than the tibia (4 : 2.5).

For palpal organ (drawn out from alveolus) see Pl. XII, fig. 3.

Total length, 2.6 mm. Length of cephalothorax, 1.5 mm.; width, 1 mm.

Length of leg I, 3.6 mm.; tib. + pat., 1.3 mm.; met., 9 mm.

Length of leg II, 3.4 mm.

Length of leg III, 3.3 mm.

Length of leg IV, 4.8 mm.; tib. + pat., 1.5 mm.; met., 1.5 mm.

Syn.—1890. *Aulonia aurantiaca*, Marx, Proc. U. S. N. M., 12.

1892. *Aulonia aurantiaca*, Marx, Proc. Ent. Soc. W., 2.

1892. *Aulonia aurantiaca*, Banks, Proc. Acad. Nat. Sci. Phila., 44, p. 73.

1898. *Trabea aurantiaca*, Simon, Hist. Nat. Araign., 2.

Type locality.—Massachusetts and Connecticut.

Known localities.—Massachusetts!, Connecticut, New York, District of Columbia!.

The genus **SOSILAUS** Simon, 1898.

(Hist. Nat. d. Araign., Vol. 2, p. 350.)

“Cephalothorax convex behind, in front long slanting and attenuated, the face rather narrow, oblique and obtuse. Four anterior eyes subcontiguous, in a gently recurved row, the median at least twice as large as the lateral. Eyes of the second row moderate, approximate, occupying a transverse space much narrower than the anterior eye row (Pl. XII, figs. 5, 6). Chelicerae rather weak, the inferior margin of the furrow tridentate. Labium longer than wide, attenuated and obtuse. Legs rather long; the metatarsi and tarsi slender and long, not scopulate; anterior tibiae armed beneath with 5–5 prone spines and the metatarsi with 3–3 similar ones, there being smaller lateral spines” (Simon).

In the character of cephalothorax and eyes this genus is very similar to *Tricca* and similarly much suggests *Allocosa*, from which it differs most conspicuously in the armature of the anterior tibiae. The posterior eyes are situated upon a very oblique plane. The eyes of the second row are relatively small.

But one species of this genus is known and that by a single specimen (*S. spinger* E. S.).

Syn.—1903. *Sosilaus* Comstock, Classification of North American Spiders.

Sosilaus spiniger Simon, 1898.

(Hist. Nat. Araign., 2, p. 350.)

“Length of male 3.7 mm.—Cephalothorax fulvo-rufous, smooth and subglabrous, a narrow marginal fuscous line and the pars thoracica marked irregularly with short radiating stripes. Abdomen fusco-testaceous, paler in front and below. Legs lurid, tarsi infuscated. Palpi lurid, the tarsus infuscated, sides parallel, setose with long

bristles below; tibia a little longer than the patella, terete, gently curved; tarsus shorter than the tibia with patella, narrowly ovate, acuminate; bulb simple."

Locality.—Louisiana.

I have not found in collections from Louisiana and neighboring States any specimens referable to this species, which remains known only from M. Simon's diagnosis and comments.

The genus **PIRATA** Sundevall, 1833.

(Subgenus sub *Lycosa*, Consp. Arachn. p. 24.)

Body clothed sparsely with short hairs, in life never cloaking and concealing the tegument as is commonly the case in *Pardosa* and *Lycosa*. Anterior tibiæ in the female armed beneath with two pairs of *spines*, respectively basal and submedian in position, never with an apical pair; these spines very long and overlapping, much longer than the diameter of the article; rarely with three pairs beneath, the third pair midway between the median pair and the distal end of the joint; tibiæ in the male with the long spines as in the female, but in addition with an apical pair (Pl. X, fig. 7). Anterior row of *eyes* as long as or but little shorter than the second, a little procurved or straight, the eyes subequal or with the median a little larger than the lateral; clypeus rather narrow, the anterior lateral eyes separated from its front margin at most by their diameter, a little farther from eyes of second row; eyes of the second row large, less than their diameter apart; dorsal eye area trapeziform, wider behind than in front. *Labium* longer than wide, attenuated anteriorly in varying degrees; basal excavation short, nearly always but one-fourth or less the length of the labium, only rarely longer. Posterior *spinnerets* much longer than the anterior, their second joint distinct and conical. *Epigynum* presenting no true guide, usually consisting behind of two strongly chitinized lobes or tubercles upon which are the openings of the spermatheca. Bulb of male *palpus* with no true scopal fold or one but slightly indicated; conductor as a conspicuous erect apophysis or process, in a mostly medio-apical position, and its principal branch reaching to or extending beyond the front margin of the alveolus; a basal spur or branch of considerable size always present on conductor; the embolus small, short, nearly concealed usually; lunate plate very large, one-third as long as the bulb.

Syn.—1848. *Lycosa* subgen. *Potamia* C. Koch, Die Arachn., 14, p. 98.

1876. *Pirata* Simon, Arachn. Fr.

1876. *Pirata* Keyserling, Verh. z. b. Ges. Wien, 26, p. 610.

1885. *Pirata* Emerton, Trans. Conn. Acad. Sci., 6, p. 492.

1890. *Pirata* Marx, Proc. U. S. N. M., 12, p. 564.
1898. *Lycosa* Simon (ad. part), Hist. Nat. Araign., 2, p. 345.
1902. *Pirata* Montg., Proc. Acad. Nat. Sci. Phila., p. 536.
1903. *Lycosa* Comstock (ad. part.), Class. N. A. Spiders, p. 51.
1904. *Pirata* Chamberlin, Can. Ent., p. 177.
1904. *Aulonia*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 265.

Cephalothorax moderately low; the pars cephalica not elevated being nearly level with the dorsal line of the pars thoracica, in front broadly obtusely rounded, the sides rounded and considerably sloping. *Face* mostly low, much shorter than the length of the chelicerae, trapeziform, the sides in most convexly rounded and widely sloping, rarely sub-straight and very steep or nearly vertical, the eyes of second row more or less distant from its upper exterior angles. Except in the few species with the sides of the face very steep, the posterior eyes when viewed from above are removed from the lateral margins of the pars cephalica by more than their diameter as is the case in *Lycosa* (Pl. X, fig. 5). Quadrangle of posterior eyes one-fourth, or usually less, the length of the cephalothorax, rarely longer. *Chelicerae* robust, the lower margin with three teeth similar to those of *Lycosa*, but with the third often conspicuously reduced as in *Pardosa*; upper margin with three teeth of the usual character; fringe of hair of upper margin more sparse than in *Lycosa*; posterior line with long but sparse hairs. *Legs* robust; tarsi in most cases simply setose on all pairs, very rarely with the anterior ones with thin lateral scopular lines as in *Pardosa*, the bristles, however, being often serried (Pl. X, fig. 7); tibia + patella of leg IV sometimes longer than, at others shorter than, the cephalothorax, longer than the metatarsus or more rarely of the same length. The cephalothorax always presents a median pale stripe, which begins on the posterior declivity as a narrow line and then continuously widens to the third eye row, there more abruptly widening, passing below the posterior eyes of each side and attaining the clypeus; the eyes are mostly upon black; the median stripe encloses in its anterior half a bifurcate or V-shaped dark mark, the undivided median part being at the anterior end of the dorsal furrow and sending an arm forward to the inner margin of the third eye on each side (Pl. X, fig. 5); marginal light stripes may or may not be present; many species are marked on the abdomen with lines and spots of bright white hair.

The *Piratas* are spiders of small or of medium size. The males are in most cases as large as or larger than the females.

In habits they are much like the *Pisauridae*. They occur in damp meadows or more especially at the margins of streams, ponds and other bodies of water, upon which they run with great ease. Many

forms in case of danger dive readily beneath the surface of the water and hide under stones, leaves, etc., at the bottom. The cocoon is carried about attached to the spinnerets, though when the females are at rest it is commonly held in the chelicerae. The cocoons are clear white in color and spherical in shape, marked at the equator by a seam less strong than that on the cocoons of *Pardosa*. The female constructs a temporary retreat under stones and other suitable places, spinning a small irregular web of very delicate texture. The greater length of the superior spinnerets would seem to be associated with this web-spinning habit.

KEY TO SPECIES OF *PIRATA*.

1. Lower margin of the furrow of the chelicerae armed with but two teeth, 2.
 Lower margin of furrow armed with three teeth, 3.
2. Cephalothorax less than 2 mm. long, *minutus* Em.
 Cephalothorax 3 mm. or more long, *marxi* Stone.
3. Cephalothorax with no submarginal light stripes, *montanus* Em.
 Cephalothorax with submarginal light stripes, 4.
4. Cephalothorax less than 2 mm. long, or at most not longer, 5.
 Cephalothorax much more than 2 mm. long, 6.
5. All joints of legs except tarsi distinctly ringed with black (female),
 aspirans Chamb.
 Femora dark at distal ends, other joints of legs light, not at all
 marked with dark, *humicolus* Mtg.
6. Cephalothorax in life or when dry showing on each side a marginal
 stripe of bright white hair, 7
 Cephalothorax showing no such stripe, *insularis* Em.
7. A black marginal stripe below each pale lateral stripe,
 piratica utahensis, new var.
 No such black marginal line, *febriculosa* (Beck.).

The key above does not include *prodigiosa* Keys. or *bilobatus* Tullg.

Pirata minutus Emerton, 1885.

(Trans. Conn. Acad. Sci., 6, p. 493, Pl. 48, figs. 10-10c.)

Female.—Sides of *cephalothorax* dark brown to gray-brown; a yellow median stripe of more or less greenish hue which begins caudally as a narrow line, but expands continuously forward to the eye region, continuing as a narrow stripe on each side below eyes to the clypeus as usual; within the median light band are two dark lines or narrow stripes extending backward from eyes of third row and uniting together into one line at the dorsal groove, forming thus the typical V-shaped mark; a marginal light stripe on each side with uneven upper border,

not extending forward beyond third eye row; in life a marginal line of white hair much narrower than light stripe of the tegument with which it is coextensive in length. *Chelicerae* black-brown, yellow distally; subsparsely clothed with rather long light gray hairs. *Labium* and *endites* dark brown, paler distally. *Sternum* deep brown to blackish, in most cases with a yellow median line and a number of yellow spots along each lateral margin; clothed with comparatively long light gray hairs. *Coxae* of legs beneath yellow. *Legs* light brown or yellow, all joints excepting the tarsi annulate with black; the femora have usually a submedian ring and a broader ring at distal end, the latter sometimes partially divided by light; the tibiae and metatarsi have a wide annulus at each end, leaving especially on the tibiae a relatively narrow yellow ring at the middle; tibiae sometimes entirely black. *Abdomen* above black, sometimes with and sometimes without narrow lanceolate yellow mark at base; dorsum clothed with sparse light brown or grayish hair, with a series of five or six spots of white hair along each side for the entire length, and posteriorly with narrow cross-lines of similar white hair, these lines sometimes indistinct; sides a little paler than the dorsum, with some streaks and dots of white pubescence; venter dark gray, more densely clothed with hair than the sides and dorsum, the hair being gray. *Epigynum* reddish brown, usually nearly or quite concealed by long gray hairs. *Spinnerets* dark brown.

Face but little more than two-thirds as high as the chelicerae are long, sides substraight and nearly vertical as in *Pardosa*.

Anterior row of *eyes* nearly as long as the second, more strongly procurved than is usual in this genus; anterior median eyes about their radius apart, a little larger than the lateral; anterior lateral eyes rather less than their diameter from front margin of clypeus, farther from eyes of the second row; quadrangle of posterior eyes one-fourth the length of the cephalothorax.

Lower margin of furrow of *chelicerae* with but two teeth which are relatively long and slender, the second one a little smaller than the first, the latter evidently representing the second of the three typically present in the *Lycosidae*.

Legs with tibia + patella of the fourth pair a little longer than the cephalothorax, which is of the same length as the metatarsus of the same legs; tibiae of first legs armed ventrally with a basal and a submedian pair of spines which are very long, overlapping as usual.

For structure of *epigynum* see Pl. XXII, fig. 7.

Total length, 3.3 mm. Length of cephalothorax, 1.8 mm.; width, 1.3 mm.

Length of leg I, 4.5 mm.; tib. + pat., 1.6 mm.; met., 1 mm.

Length of leg II, 4.4 mm.

Length of leg III, 3.8 mm.

Length of leg IV, 6.3 mm.; tib. + pat., 2 mm.; met., 1.8 mm.

Male.—Femora of first two pairs of legs black, others dusky yellow; all other joints clear yellow, without indications of any dark marks; palpi entirely black, except the patellæ which often are paler above; coloration otherwise nearly as in female, but in general darker.

Tibia of palpus considerably longer than patella, and narrower than tarsus; main process of apophysis of conductor with its upper half bent outward at right angles to lower half at or a little in front of front margin of alveolus; basal spur ending apically in an acute point (Pl. XXI, fig. 9).

Total length, 2.9 mm. Length of cephalothorax, 1.6 mm.; width, 1 mm. Length of leg I, 4.4 mm.

Syn.—1890. *Pirata minuta* Em., Banks, Proc. Acad. Nat. Sci. Phila., 44, p. 72.

— *Pirata exigua* Banks, Proc. Acad. Nat. Sci. Phila., 44, p. 72, Pl. 1, fig. 48.

1890. *Pirata minuta* Em., Marx, Proc. U. S. N. M., 12, p. 564.

Non-syn.—1892. *Pirata minuta* Em., Fox, Proc. Ent. Soc. W.

Syn.—1898. *Pirata minutus* Em., Simon, Hist. Nat. Araign., II, p. 335.

Type locality.—Massachusetts and Connecticut.

Known localities.—Massachusetts!, Connecticut, New York (Ithaca!).

I have found females of this species with egg-sacs fairly common in certain damp meadows about Ithaca, New York, late in the summer. A few were taken at the margins of ponds. The male above described, from Massachusetts, was kindly loaned me by Mr. J. H. Emerton.

Pirata aspirans Chamberlin, 1904.

(Can. Ent., Vol. XXXVI, p. 286.)

Female.—Sides of *cephalothorax* dark brown crossed by radiating lines of black; a pale median band beginning at posterior margin narrows to caudal end of thoracic furrow, then widens gradually to eyes of third row where it more or less abruptly widens and encloses the eye area, below which on each side it attains the clypeus as usual; within the median pale band a median line at front of furrow bifurcates, sending a branch to eyes of each side as usual; eyes surrounded by black; clypeus yellow; a marginal band of yellow on each side, limited below by a line of black, these side stripes extending forward only to opposite the third eyes. *Chelicerae* reddish yellow, smoky over middle region and with branching lines of black over basal area. *Labium* yellow. *Endites* yellow above, and darker, dusky-brown below.

Sternum and *coxae* of legs beneath immaculate yellow. *Legs* yellow; all joints except the tarsi more or less distinctly banded with black rings; these dark rings on femora of first legs confluent and also semi-confluent on other joints; femora with four rings, of which the apical one may be indistinct. Dorsum of *abdomen* black, at sides minutely punctate with yellow; at base a lanceolate yellow mark, on each side of which just behind middle is a small ovate yellow spot with black dot at center, and each side of apex a larger triangular yellow spot; behind is a series of yellow transverse bowed or chevron-shaped transverse marks which become successively shorter caudad, the last few being diamond shaped and contiguous by their apices; sides of abdomen above like sides of dorsum, but below becoming more and more yellow, the black being first reduced to spots and then quite disappearing at venter; venter yellow, dusky in front of the genital furrow and also with a dusky interrupted median band extending back from epigynum two-thirds the distance to the spinnerets, and on each side of venter a narrow irregularly edged black line which does not extend all the way to the spinnerets behind. *Spinnerets* yellow. *Epigynum* reddish yellow.

Sides of *face* of moderate steepness; face a little more than half as high as the *chelicerae* are long. Seen in profile, the dorsal line of the cephalothorax is straight and horizontal or nearly so between the eyes and the posterior declivity, the *pars cephalica* not being elevated at all above the *pars thoracica*. Lower margin of furrow of *chelicerae* with three teeth, of which the middle one is much stoutest and longest, the first one clearly the smallest; the upper margin with three teeth of the usual proportions. *Labium* slightly longer than broad (5:4.8), four and five-tenths times longer than its basal excavation strongly converging anteriorly; anterior margin indented mesally with its side parts convexly rounded. *Legs* with tibia + patella of the fourth pair much longer than the cephalothorax, which is of the same length as the tibia + patella of the first pair; spines of anterior tibiae very long, those of the first pair to or a little beyond the middle of the joint.

Anterior row of *eyes* but slightly procurved, shorter than the second; anterior median eyes about two-thirds their diameter apart, closer to the lateral eyes which are two-thirds as large, hardly two-thirds their diameter from eyes of second row; anterior lateral eyes three-fourths their diameter from front margin of clypeus, their diameter or slightly more from eyes of second row; eyes of second row two-thirds their diameter apart; quadrangle of posterior eyes slightly wider in front than long, longer behind than in front in ratio of 9:7 (nearly), one-fourth as long as the cephalothorax.

Epigynum with the lateral tubercles widely rounded behind, being mesally shallowly angularly excavate (Pl. XXII, fig. 6).

Total length, 4 mm. Length of cephalothorax, 1.9 mm.; width, 1.4 mm.

Length of leg I, 5.4 mm.; tib. + pat., 1.9 mm.; met., 1.2 mm.

Length of leg II, 5.1 mm.

Length of leg III, 4.7 mm.

Length of leg IV, 7.3 mm.; tib. + pat., 2.3 mm.; met., 2 mm.

Male.—For structure of palpal organ see Pl. XXII, fig. 5.

Syn.—1890. *Pirata minuta* Fox (at least ad. part.), Proc. Ent. Soc. W.

Locality.—Washington, D. C.!

***Pirata humicolus* Montgomery, 1902.**

(Proc. Acad. Nat. Sci. Phila., p. 575, Pl. 30, figs. 40, 41.)

Female.—Sides of the *cephalothorax* brown to black with lighter radiating lines; a yellow median band widening from behind, where it is a mere line, forward and enclosing the usual dark bifurcate mark in its front half; on each side a yellow supramarginal stripe which does not extend upon the pars cephalica and which is limited below by a black marginal line; in life there is a marginal line of white hair. *Chelicerae*, *labium* and *endites* dark reddish brown. *Sternum* dark brown, paler along middle and darker at lateral margins. *Legs* brown, often of greenish hue, the *coxae* beneath paler, yellow. *Palpi* like the legs, paler at the base. *Dorsum* of *abdomen* brown of greenish tinge; a basal lanceolate median stripe; two rows of light spots clothed with white pubescence on each side of the basal stripes and extending to the spinnerets behind, the outer line often evidently only caudally, the spots of the inner lines largest anteriorly connected by some thin cross-lines of white hair; sides of *abdomen* yellowish brown tinged with green; *venter* clear yellow, sometimes a few small black dots in front of spinnerets. *Epigynum* reddish brown. *Spinnerets* yellow.

Chelicerae one and one-third times the height of the *face*, the sides of which are subvertical as in *Pardosa*. Anterior row of *eyes* a little shorter than the second, a little procurved; eyes of second row nearly their diameter apart; quadrangle of posterior eyes one-fifth as long as the cephalothorax. Lower margin of the furrow of the *chelicerae* armed below with three teeth.

Total length, 4 mm. Length of cephalothorax, 1.8 mm.

Length of leg I, 4.8 mm.

Length of leg II, 4.3 mm.

Length of leg III, 4.2 mm.

Length of leg IV, 6.1 mm.

Male.—Coloration darker than in the female. *Cephalothorax* nearly black. *Abdomen* nearly as in female but the venter darker. *Chelicerae* black. *Legs* yellow except the femora of the first two pairs which are black. Femur of *palpi* black, the other joints paler.

Total length, 2.9 mm. Length of cephalothorax, 1.7 mm.

Syn.—1903. *Pirata humicolus* Montgomery, Proc. Acad. Nat. Sci. Phila., p. 654.

1904. *Aulonia humicola*, Montgomery, Proc. Acad. Nat. Sci. Phila. p. 265, Pl. XX, fig. 33.

Locality.—Pennsylvania.

Known localities.—Pennsylvania!, New Jersey.

Pirata montanus Emerton, 1885.

(Tr. Conn. Acad. Sci., p. 493, Pl. 48, fig. 9.)

Female.—Sides of *cephalothorax* deep brown or blackish with no lighter marginal stripes; a yellow or reddish-yellow median stripe beginning at the clypeus enclosing the dorsal eyes and then narrowing caudad, ending as a pointed line on the posterior declivity; median band enclosing in front of dorsal groove a dark stripe which bifurcates, sending one of its branches forward to and along the inner margins of the eyes of each side; eyes enclosed with black; in life on each side a marginal line of white hair. *Chelicerae* dark brown, paler distally, the tips of claws reddish. *Labium* and *endites* brown, lighter distally as usual. *Sternum* brown, a dark line or row of dark spots on each side, the two converging caudad. *Legs* yellow, without markings excepting sometimes faint annuli on femora. *Abdomen* above black; a reddish-brown median lanceolate stripe at base extending to middle; each side of apex of this stripe a reddish spot and behind a number of chevron-shaped transverse marks; all these marks may be indistinct and sometimes the basal stripe alone is distinguishable; in life there is on each side a series of about six spots of light yellow hair; sides colored like the dorsum but in life more densely pubescent; a short line of yellow hair passing back across each antero-lateral angle, the sides elsewhere being clothed with black hairs with more scattered ones of yellow; venter brown, clothed with yellowish gray pubescence. *Spinnerets* brown. *Epigynum* reddish black.

Sides of *face* steep, but evidently diverging outward below.

First row of *eyes* nearly as long as the second, a little procurved; anterior median eyes more than half their diameter apart (nearly three-fourths),

nearly the same distance from the smaller lateral eyes (about 3 : 4); anterior lateral eyes their diameter or rather a little less from the front margin of clypeus, more than their diameter from eyes of second row; eyes of second row less than their diameter apart; quadrangle of posterior eyes more than one-fifth the length of the cephalothorax (1 : 4.5).

Lower margin of the furrow of *chelicerae* with three teeth, of which the middle one is usually a little longest.

Legs with tibia + patella IV longer than the cephalothorax, which latter is longer than tibia + patella I; anterior tibiae beneath with three pairs of very long overlapping spines, the third pair being between the middle pair and the distal end of the joint and truly ventral in position (Pl. X, fig. 9); patella II armed in front.

Epigynum with the posterior margin nearly straight; not excavated mesally; the bulbs of the spermathecae contiguous mesally. (Pl. XXII, fig. 9.)

Total length, 2.4 mm. Length of cephalothorax, 5 mm.

Length of leg I, 6.5 mm.; tib. + pat., 2.2 mm.; met., 1.5 mm.

Length of leg II, 6.2 mm.

Length of leg III, 6.1 mm.

Length of leg IV, 9.4 mm.; tib. + pat., 3 mm.; met., 2.8 mm.

Syn.—1890. *Pirata elegans* Stone, Proc. Acad. Nat. Sci. Phila., 42.

— *Pirata montanus*, Marx, Proc. U. S. N. M., 12, p. 564.

1892. *Pirata agilis* Banks (ad. part), Proc. Acad. Nat. Sci. Phila., 44, p. 72, Pl. I, fig. 47.

1902. *Pirata elegans*, Montg., *op. cit.*, p. 581, Pl. XXX, fig. 36.

— ?*Pirata nigromaculatus* Montg., *ibid.*, p. 579, Pl. 30, figs. 44, 45.

1904. *Pirata elegans*, Montgomery, *ibid.*, p. 310.

— ?*Pirata nigromaculatus*, *ibid.*, p. 310.

Type locality.—New Hampshire (White Mountains) and New York (Adirondack Mountains at Long Lake).

Known localities.—New York!, New Hampshire, Pennsylvania, Utah!.

Pirata marxi Stone, 1890.

(Proc. Acad. Nat. Sci. Phila., 42.)

Female.—Sides of *cephalothorax* in fresh specimens obscure brown to gray-black, crossed by many radiating lines of black; a yellow median band of the typical form enclosing the usual bifurcate mark in front of the dorsal groove, the mark coalescing on each side just in front of the groove with the dark area of the sides; there is thus between the arms of the V-mark a narrow median yellow stripe or line which extends forward to the second eye row, and on each side of pars cephalica also a narrow line which extends forward beneath the eyes to the clypeus, but which is disconnected with the median stripe behind; on each side a

supramarginal yellow stripe with uneven upper margin, and limited below by a black marginal line; no marginal stripe of white hair. *Chelicerae* reddish brown. *Endites* brown, pale distally, the *labium* in most darker, dusky-brown to blackish. *Sternum* brown. *Coxae* of legs beneath yellow. *Legs* clear yellow, darker distally, entirely without dark rings or markings. *Abdomen* yellow with markings in black as follows: at base above a lanceolate outline; along each side of dorsum a wavy or zigzag stripe, the two converging to spinnerets, each united with lanceolate basal mark at its base and again at its middle; the outwardly directed angles of these dark stripes often more or less extended down the sides as narrow lines; along the median line of dorsum behind several short black marks, sides of abdomen antero-ventrally with a dark area composed of a close network of black lines, and postero-dorsally with a number of isolated dark areas formed of similar reticulations, leaving thus in most a clear yellow stripe of varying width curving from the dorso-anterior angle obliquely downward and backward between the two darkened areas described; a row of spots of yellow hair on each side of dorsum behind; venter with some scattered minute black dots, a few usually just behind the epigynum and more numerous ones in front of spinnerets, the latter usually forming two short lines close together which may extend forward to middle or even to the spots behind epigynum, sides and venter clothed with yellow hair. *Spinnerets* yellow. *Epigynum* pale brown, reddish marginally, darker caudad.

Face rather low and wide, sides well rounded and slanting. *Cephalothorax* high; highest at third eye row, from there convexly rounded to the dorsal groove; posterior declivity steep.

Anterior row of *eyes* as wide as the second, nearly straight, the centers of the lateral eyes being but little lower than those of the median; anterior median eyes a little larger than the lateral, scarcely one-third their diameter apart, their radius from eyes of second row; anterior lateral eyes four-fifths their diameter from front margin of clypeus, the same distance from eyes of second row; eyes of second row less than their radius apart (2:5); quadrangle of posterior eyes less than one-fifth as long as cephalothorax (1:5.5), wider in front than long, very wide behind, being wider than in front in ratio of 8.4:5.6.

Lower margin of furrow of *chelicerae* with but two teeth. *Labium* longer than wide, the basal excavation longer than is common; front margin substraight, or but slightly convex. *Legs* with the tibia + patella of the fourth pair longer than the cephalothorax; the corresponding joints of the first pair slightly shorter than the cephalothorax; anterior

tibiæ armed below with two pairs of spines in the usual position, shorter than usual in this genus, those of the first pair not overlapping the bases of the second, to which they usually do not fully extend; all tarsi subsparsely setose.

The *epigynum* is a large quadrangular area which is somewhat wider in front than behind, the lateral margins being substraight and a little converging caudad; the posterior border is angularly excavated at the middle and the spermatheca open on each side caudad directly into the excavation, their terminal portions often showing darkly through the chitinous wall. (Pl. XXII, fig. 8.)

Total length, 7.2 mm. Length of cephalothorax, 3.2 mm.; width, 2.2 mm.

Length of leg I, 8.7 mm.; tib. + pat., 3.1 mm.; met., 2 mm.

Length of leg II, 8.1 mm.

Length of leg III, 7.9 mm.

Length of leg IV, 10.6 mm.; tib. + pat., 3.5 mm.; met., 3 mm.

Male.—*Coloration* as in the female.

Tibia of the *palpus* longer than the patella, of the same thickness (seen from above); tarsus much broader than the tibia. Principal branch of apophysis of conductor long, curving outward above; basal branch relatively large; base of apophysis farther caudad than usual. (Pl. XXI, fig. 8.)

Total length, 5.6 mm. Length of cephalothorax, 3 mm.; width, 2.3 mm.

Length of leg I, 8.5 mm.; tib. + pat., 3.1 mm.; met., 2.1 mm.

Length of leg II, 7.9 mm.

Length of leg III, 7.3 mm.

Length of leg IV, 10.4 mm.; tib. + pat., 3.2 mm.; met., 3 mm.

Syn.—1885. *Pirata piratica* Emerton (non Cl.), Tr. C. Acad. Sci., 6, p. 492, Pl. 48, figs. 7 to 7b.

1890. *Pirata piratica* Marx, Proc. U. S. N. M., 12, p. 564.

1891. *Pirata piratica* Marx, Proc. Ent. Soc. W., p. 161.

1892. *Pirata piratica* Banks, Proc. Acad. Nat. Sci. Phila., 44.

1902. *Pirata piratica* Emerton, Com. Sp. U. S., p. 84, figs. 208, 209.

1902. *Pirata marxi*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 582, Pl. XXX, fig. 47.

1904. *Pirata marxi*, Montgomery, *ibid.*, p. 309, Pl. XIX, fig. 27.

Type locality.—Pennsylvania (York County).

Known localities.—Massachusetts!, Connecticut, Rhode Island!, New York!, District of Columbia.

Pirata insularis Emerton, 1885.

(Tr. Conn. Acad. Sci., 6, p. 492, Pl. 48, figs. 8, 8a.)

Female.—Sides of *cephalothorax* brown crossed by radiating lines of

black; a median reddish-yellow band of the usual form enclosing the V-shaped mark in front; on each side also a yellowish supramarginal stripe with uneven upper edge and limited below by a narrow dark marginal stripe, this stripe not extending forward beyond the cervical furrow; cephalothorax with sparse, short dark hairs, no marginal lines of white pubescence. *Chelicerae* reddish yellow, clothed sparsely with light gray hair. *Labium* and *endites* reddish yellow, paler distally. *Sternum* and *coxae* of legs beneath reddish yellow, sparsely provided with mostly stiff blackish hairs, the former often blackish along sides and pale mesally. *Legs* brownish yellow, all joints excepting the tarsi with more or less distinct dark annulations, or these sometimes very indistinct on or absent from the metatarsi. *Abdomen* above blackish; at base above a yellow lanceolate median stripe extending caudally to the middle; each side of the apex of the lanceolate stripe is a yellow spot and behind is a number of transverse yellow marks, each of which has in most cases the shape of an open angle with the apex directed forward, but more rarely the marks are nearly straight; each side of the median markings of the dorsum above described is in life a series of white spots formed of bunches of white hair, the dorsum elsewhere being sparsely clothed with short yellowish hairs and more scattered long dark bristles; a narrow yellow stripe or row of yellow spots passing over each antero-lateral angle caudally, breaking up over the side into more scattered yellow dashes; this yellow stripe on front of sides often partly masked by white hair, but this hair never forming a very distinct or extensive line or stripe; venter pale yellow to grayish, a darker median line behind epigynum, hair of entire venter yellow. *Spinnersets* light brown.

Seen in profile the dorsal line of the *cephalothorax* is nearly horizontal, notched at dorsal groove. The *chelicerae* about one and one-fourth times the height of the *face*.

First row of *eyes* nearly as long as the second, nearly straight; anterior median eyes less than their radius apart, closer to the evidently smaller lateral eyes; anterior lateral eyes less than their diameter from front margin of clypeus, some more than their diameter from eyes of second row; quadrangle of posterior eyes one-fifth as long as the cephalothorax.

Labium longer than wide (7 : 6); basal excavation a little more than one-fourth as long as the labium; sides below straight and but slightly converging, more strongly converging and more rounded above; front margin substraight, being very slightly bowed forward. *Legs* with the tibia + patella of the fourth pair clearly longer than the cephalothorax,

the corresponding joints of the first legs being also a little longer; anterior tibiae armed beneath as usual; patella of leg I unarmed, that of leg II with a spine in front; tarsi setose.

Epigynum presenting two more or less divergent tubercles caudad, upon the ventral face of which the spermatheca open; these tubercles, at first angular, may become more rounded with age. (Pl. XXII, fig. 4.)

Total length, 6.5 mm. Length of cephalothorax, 3.1 mm.; width, 2.2 mm.

Length of leg I, 9.2 mm.; tib. + pat., 3.3 mm.; met., 2.2 mm

Length of leg II, 8.4 mm.

Length of leg III, 7.7 mm.

Length of leg IV, 11.6 mm.; tib. + pat., 3.7 mm.; met., 3.6 mm.

Male.—*Coloration* nearly as in female except that the femora and tibiae are indistinctly annulate and the other joints clear yellow; the palpi are brown of reddish tinge.

For structure of palpus see Pl. XXII, fig. 3.

Total length, 4.5 mm. Length of cephalothorax, 2.2 mm.

Syn.—1890. *Pirata insularis*, Marx, Proc. U. S. N. M., 12, p. 564.

1892. *Pirata insularis*, Banks, Proc. Acad. Nat. Sci. Phila., 44, p. 71.

1902. *Pirata liber* Montgomery, *op. cit.*, p. 578, Pl. 30, figs. 42, 43.

1904. *Pirata liber*, *ibid.*, p. 311.

Type locality.—Long Lake, Adirondack Mountains, New York.

Known localities.—Rhode Island!, New York!, Pennsylvania!.

This is a common species which is subject to considerable variation, both in some of its structural characters and, more noticeably, in depth of coloration. In some the annulations are very deep and distinct and the body parts are correspondingly dark, while in others the annulations may be very indistinct.

***Pirata febriculosa* (Beck), 1881.**

(Ann. Soc. Ent. Belg., 25, Pl. 3, figs. 2, 2a.)

Female.—Sides of *cephalothorax* dark brown to blackish of usually greenish tinge; a reddish yellow median band narrow caudally and widening anteriorly to the eye region, where it expands and passes below the eyes of each side and attains the clypeus; in front of dorsal furrow a median black line which bifurcates sending a branch forward to inner side of third eye of each side in the usual manner; on each side a moderately wide yellow or reddish-yellow marginal band which extends forward as far as the cervical furrow; clypeus yellow; eye region black; along each lateral margin in life a distinct line of white

hair much narrower than the light band in tegument; the sides of the cephalothorax are sparsely clothed with short black hairs. *Chelicerae* yellowish brown, distally reddish yellow, clothed subsparsely with long light gray hair. *Labium* pale brown, lighter distally. *Sternum* and *coxae* of legs beneath yellow, clothed sparsely with blackish hairs. *Legs* greenish yellow, more reddish distally, sometimes without evident markings, but in the great majority with faint dark annulations showing most distinctly on the femora and tibiae of the posterior pairs; these annuli usually broken above. *Abdomen* above black or blackish brown; at base is a narrow lanceolate reddish-yellow stripe which ends at middle and is margined with a line of black, outside and parallel with the black edge being in life a line of white hair, the two white lines meeting at a truncate angle on posterior portion of dorsum, these lines sometimes each reduced to a row of spots or less commonly entirely absent; a narrow stripe of white hair passing caudad over each antero-lateral angle and spreading out usually in streaks over the upper part of side and connecting behind with the white of opposite side above spinnerets; lower portion of sides brown and, like most of dorsum, clothed with brown hair; venter brown to gray, paler in front of genital-furrow. Tubercles of *epigynum* reddish. *Spinnerets* pale brown.

Face a little more than half as high as the length of the *chelicerae*.

Anterior row of eyes nearly as long as second, slightly procurved; anterior median eyes their radius apart; much closer to the lateral eyes; anterior lateral eyes considerably smaller than the median, their diameter or nearly so from the front margin of clypeus, more than their diameter from eyes of second row; eyes of second row considerably less than their diameter apart; quadrangle of posterior eyes less than one-fifth as long as the cephalothorax (1 : 5.5).

Chelicerae armed as usual. *Labium* longer than wider (10.5 : 10); basal excavation short, scarcely more than one-fifth as long as labium; lower part of sides nearly straight, only slightly converging, but for upper third more strongly rounded and converging; front margin truncate. *Legs* with the tibia + patella of the fourth pair longer than the cephalothorax; the corresponding joints of the first pair shorter than the cephalothorax; tarsi of first two pairs of legs scopulate laterally, those of the posterior pairs simply setose; anterior tibiae below with the usual basal and submedian pairs of legs which are long, the first well overlapping the second; patellae of first legs unarmed, those of second with a spine on anterior face.

Epigynum presenting behind two angular tubercles, the inner or mesal faces of which are nearly parallel and are more than usually

close together leaving the excavation between them narrow; their outer faces clearly more strongly diverging than the inner. (Pl. XXII, fig. 2.)

Total length, 7.2 mm. Length of cephalothorax, 3.3 mm.; width, 2.6 mm.

Length of leg I, 8.5 mm.; tib. + pat., 3 mm.; met., 2 mm.

Length of leg II, 7.6 mm.

Length of leg III, 7.3 mm.

Length of leg IV, 11.2 mm.; tib. + pat., 3.6 mm.; met., 3.2 mm.

Male.—For structure of palpal organ see Pl. XXII, fig. 1.

Syn.—1904. *Lycosa wacondana* Scheffer, The Industrialist, Kansas, p. 13, Pl. I, fig. 7.

1904. *Pirata sedentarius*, Montgomery, Proc. Acad. Nat. Sci. Phila., p. 312.

Type locality.—Kansas.

Known localities.—New York!, Kansas!, Iowa!, Texas!.

Apparently this species is close to *L. piratica*. The palpal organs are similar, but in *febriculosa* the superior horn of the apophysis is at once seen to be longer and straighter and more outwardly directed.

***Pirata piratica* (Clerck) var. *utahensis*, new.**

Male.—Palpal organ agreeing in detail with that of the European species or nearly so.

Cephalothorax with the median pale stripe and dark V-shaped enclosure as usual, the arms of the latter parallel anteriorly back to posterior third, then converging to a point. Lateral pale stripes reaching pars cephalica, each bordered below with a dark marginal stripe. A marginal line of bright white hair showing in life or in dry specimen as in *febriculosa* and *piratica* of type form. Femora of all legs with dark annuli, these most distinct on second and third pairs, showing clearly on the ventral surface of the latter; other joints unmarked, distal ones some darker. *Sternum* and *coxæ* beneath pale. *Abdomen* black above, the usual pale mark at base; a white stripe of hair over each antero-lateral angle; a narrower line of white hair each side of basal mark, followed behind by a row of white spots similarly formed; venter pale, with three narrow stripes of brown converging caudally.

Length, 6.2 mm. Length of cephalothorax, 3.4 mm.; width, 2.5 mm.

Locality.—Utah!.

Likely to be found throughout the Pacific States.

***Pirata prodigiosa* Keyserling, 1876.**

(Verh. z. b. Ges. Wien, 26, p. 669, Pl. 8, fig. 44.)

Female.—*Cephalothorax* brown with a narrow black line along each

lateral margin, above which is an uneven edged, wavy yellow stripe; a similarly colored median band, which beginning narrow behind widens cephalad, is constricted a little behind the eyes and then again widens to enclose the eyes as usual, embracing in its anterior half two dark elongate marks which beginning at the two posterior eyes converge and unite at the front end of the median furrow; eyes enclosed in black. *Chelicerae* reddish yellow. *Labium* brownish yellow with paler tip. *Sternum* blackish with a yellow median stripe and on each side three similarly colored elongate spots. *Legs* yellow, a little darker distally, with faint indications of light rings. *Palpi* yellow, distal joints brown. *Abdomen* above dark gray; anteriorly with a yellow stripe, near this two small spots, and behind this and extending to the spinnerets a number of paired successively smaller and smaller spots of the same yellow color; sides marked with small streaks and dots of yellow; venter smoky white with three brown longitudinal stripes and several similarly colored streaks at the sides of these. *Epigynum* clear reddish brown. *Spinnerets* brownish yellow. In a second specimen the sternum has two dark, indistinct, parallel longitudinal lines over its middle region.

Cephalothorax shorter than the tibia + patella of the fourth pair of legs, as wide as the metatarsus of the same legs, not highly arched, the entire back apparently of similar height, toward the lateral margins flat and toward the nearly straight caudal margin rather steeply sloping; cephalic furrows indistinct, the head in front low and sloping flatly at the sides.

Anterior row of *eyes* straight, somewhat shorter than the second, separated from the latter and from the margin of the clypeus by not fully the diameter of one of the somewhat larger median eyes; eyes of the second row nearly their diameter apart, more than this from the two-thirds as large eyes of the third, distinctly wider row; entire eye area wider behind than in front. *Chelicerae* somewhat enlarged in front, not entirely twice as wide as the *labium*, which is somewhat longer than wide and is anteriorly somewhat excavated. *Sternum* somewhat longer than broad, moderately arched and clothed with a few black bristles. *Legs* moderately slender, the fourth pair somewhat more than three and one-half times as long as the cephalothorax and about twice the length of its tarsus longer than the first; tibia + patella IV somewhat longer than metatarsus which is longer than the femur; principal claws of tarsi with 6-7 teeth, the middle one with none; only a thin scopula on tarsi of the two first pairs, none on the posterior; spines of femur I above 1, 1, 1, within 1, without none, of patella I

none, of tibia I below 2, 2, 2, within 1; spines of second legs the same as for I. Posterior *spinnerets* twice as long as the anterior and distinctly two-jointed; the middle pair very slender but as long as the anterior.

Total length, 6.2 mm. Length of cephalothorax, 2.8 mm.; width, 2.2 mm.

Length of leg I, 7.9 mm.; tib. + pat., 2.8 mm.; met., 1.7 mm.

Length of leg II, 7.3 mm.

Length of leg III, 6.8 mm.

Length of leg IV, 10.1 mm.; tib. + pat., 3.3 mm.; met., 3 mm.

Syn.—1890. *Pirata prodigiosa* Marx, Proc. U. S. N. M., 12, p. 64.

Locality.—Illinois (Peoria).

Types in collection of Dr. Koch.

***Pirata bilobata* (Tullgren), 1901.**

(Bih. till sv. Vet.-Akad. Handl., B. 27, Abd. 4, No. 1, p. 22, Plate, fig. 12.)

Female.—*Cephalothorax* light brown, clothed with short dark adpressed hairs and strewed with long dark upturned bristly hairs; the pars cephalica with three lighter bands and at the margins of pars thoracica a broad light band. *Chelicerae* light brown and strewed with long bristly hairs. *Endites* yellow and clothed by long bristly hairs. *Sternum* light brown, clothed by long black bristly hairs. *Legs* pale brown. *Abdomen* above dark brown with a lighter middle band and three pairs of very small white spots; the venter light yellowish brown. *Epigynum* dark corneous.

Cephalothorax with a long and distinct central furrow on pars thoracica; in length a little shorter than the length of tibia and patella and the breadth shorter than the length of tibia of the fourth pair of legs. Front row of *eyes* distinctly procurved; the intervals about equal; the central eyes nearly twice as large as the lateral eyes; the interspace between the central eyes and the margin of the clypeus as long as the diameter of the eyes; eyes of the middle row separated from each other by an interspace about as broad as their diameter and separated from the central anterior eyes by an interspace about as long as the diameter of these eyes; the distance from the posterior eyes a little longer than the diameter of the middle eyes. *Chelicerae* about twice as long as the face, tapering at the apex. *Endites* about twice as long as labium.

The *epigynum* bilobate, the lobes rounded.

Total length, 3.8 mm. Length of cephalothorax, 2.5 mm.; width, 1.8 mm.

Length of leg I, 6.8 mm.

Length of leg IV, 8.6 mm.

Locality.—Florida. Two adult females from Lake Leonore in Orange County.

Although this species was described as a *Pardosa*, it seems very clear from the structure of the epigynum, as shown in the figure accompanying the original description, taken in connection with several points in the description, that it is a *Pirata*. The statement that the pars cephalica is marked with "three lighter bands" indicates the presence of the peculiar *Pirata* marking of the cephalothorax.

EXPLANATION OF PLATES VIII-XXIII.

PLATE VIII.—GENERAL CHARACTERISTICS OF THE GENUS *PARDOSA*.

- Fig. 1.—Right chelicera of *P. sternalis*.
- Fig. 2.—Dorsal view of the cephalothorax of *P. lapidicina*.
- Fig. 3.—Right chelicera of *P. atra*.
- Fig. 4.—Labium of *P. lapidicina*.
- Fig. 5.—Face of same.
- Fig. 6.—Labium of *P. emertoni*.
- Fig. 7.—Ventral view of tarsus of first leg of *P. sternalis*.
- Fig. 8.—Labium of *P. atra*.
- Fig. 9.—Tibia of first leg of *P. sternalis* seen from behind and slightly below.

PLATE IX.—GENERAL CHARACTERISTICS OF THE GENUS *LYCOSA*.

- Fig. 1.—Right chelicera of *L. gulosa*.
- Fig. 2.—Dorsal view of cephalothorax of *L. helluo*.
- Fig. 3.—Right chelicera of *L. kochii*.
- Fig. 4.—Tibia of first leg of same viewed from behind and a little below.
- Fig. 5.—Face of *L. helluo*.
- Fig. 6.—Tarsus of fourth leg of same seen from the side.
- Fig. 7.—Side view of tarsus of first leg of *L. helluo* showing scopula.
- Fig. 8.—Labium of *L. erratica*.
- Fig. 9.—Labium of *L. aspersa*.

PLATE X.—GENERAL CHARACTERISTICS OF THE GENERA *ALLOCOSEA* AND *PIRATA*.

- Fig. 1.—Tibia of first leg of *A. degesta* viewed from the side and a little below.
- Fig. 2.—Face of same.
- Fig. 3.—Tibia of first leg of *A. junerea* seen from the side and a little below.
- Fig. 4.—Labium of same.
- Fig. 5.—Dorsal view of cephalothorax of *P. montanus*.
- Fig. 6.—Labium of same.
- Fig. 7.—Tibia of first leg of same viewed from the side and a little below.
- Fig. 8.—Spinnerets of same viewed from the side.
- Fig. 9.—Tarsus of first leg of *P. montanus* viewed from the side.

PLATE XI.—GENERAL CHARACTERISTICS OF THE GENERA *SOSIPPUS* AND *TRABEA*.

- Fig. 1.—Labium of *S. floridanus*.
- Fig. 2.—Face of same.
- Fig. 3.—Right chelicera of same.
- Fig. 4.—Tibia of first leg of same viewed from in front and a little below.
- Fig. 5.—Spinnerets of same.
- Fig. 6.—Tarsus and part of metatarsus of first leg of same viewed from the side.
- Fig. 7.—Right chelicera of *T. aurantiaca*.
- Fig. 8.—Dorsal view of cephalothorax of *T. aurantiaca*.
- Fig. 9.—Labium of *T. aurantiaca*.

PLATE XII.—GENERAL CHARACTERISTICS OF THE GENUS *TRABEA* (continued)
AND *SOSILAUS*.

- Fig. 1.—Face of *T. aurantiaca*.
- Fig. 2.—Epigynum of *T. aurantiaca*.
- Fig. 3.—Male palpal organ of *T. aurantiaca* drawn out from the alveolus.
- Fig. 4.—Tibia of first leg of *T. aurantiaca* viewed from the side and below.
- Fig. 5.—Dorsal view of front part of pars cephalica of *S. spiniger*.
- Fig. 6.—Face of *S. spiniger*.

PLATE XIII.—COPULATORY ORGANS OF SPECIES OF *PARDOSA*.

- Fig. 1.—Epigynum of *P. saxatilis*.
- Fig. 2.—Palpus of same.
- Fig. 3.—Epigynum of *P. milvina*.
- Fig. 4.—Palpus of same.
- Fig. 5.—Epigynum of *P. sternalis*.
- Fig. 6.—Palpus of same.
- Fig. 7.—Epigynum of *P. banksi*.
- Fig. 8.—Epigynum of *P. atra*.
- Fig. 9.—Epigynum of *P. pauxilla*.

PLATE XIV.—COPULATORY ORGANS OF SPECIES OF *PARDOSA* (CONTINUED).

- Fig. 1.—Epigynum of *Pardosa emertoni*.
- Fig. 2.—Epigynum of *P. sternalis*, immature (*P.* = *coloradensis* Bks.).
- Fig. 3.—Epigynum of *P. xerampelina*.
- Fig. 4.—Palpus of same.
- Fig. 5.—Epigynum of *P. californica*.
- Fig. 6.—Epigynum of *P. grænländica*.
- Fig. 7.—Epigynum of *P. lapidicina*.
- Fig. 8.—Palpus of same.
- Fig. 9.—Epigynum of *P. moesta*.

PLATE XV.—COPULATORY ORGANS OF SPECIES OF *PARDOSA* (CONTINUED).

- Fig. 1.—Epigynum of *P. modica*, typical form.
- Fig. 2.—Palpus of *id.*, typical form (after Emerton).
- Fig. 3.—Epigynum of *P. modica* var. *brunnea*.
- Fig. 4.—Palpus of same.
- Fig. 5.—Epigynum of *P. mackenziana*.
- Fig. 6.—Palpus of same, front view (after Emerton).
- Fig. 7.—*Id.*, side view (after Emerton).
- Fig. 8.—Epigynum of *P. distincta* (after Emerton).
- Fig. 9.—Palpus of same (after Emerton).

PLATE XVI.—THE GENUS *SCHIZOCOSA*.

- Fig. 1.—Epigynum of *S. ocreata*.
- Fig. 2.—Palpus of *S. saltatrix*.
- Fig. 3.—Epigynum of *S. bilineata*.
- Fig. 4.—Epigynum of *S. saltatrix*.
- Fig. 5.—Palpus of *S. ocreata*.

PLATE XVII.—COPULATORY ORGANS OF SPECIES OF *LYCOSA*.

- Fig. 1.—Epigynum of *L. helluo*.
- Fig. 2.—Palpus of same.
- Fig. 3.—Epigynum of *L. erratica*.
- Fig. 4.—Palpus of same.
- Fig. 5.—Epigynum of *L. riparia*.
- Fig. 6.—Palpus of same.
- Fig. 7.—Epigynum of *L. aspersa*.
- Fig. 8.—Palpus of same.
- Fig. 9.—Epigynum of *L. scutulata*.

PLATE XVIII.—COPULATORY ORGANS OF SPECIES OF *LYCOSA* (CONTINUED).

- Fig. 1.—Palpus of *L. scutulata*.
- Fig. 2.—Epigynum of *L. punctulata*.

- Fig. 3.—Palpus of same.
- Fig. 4.—Epigynum of *L. frondicola*.
- Fig. 5.—Palpus of same.
- Fig. 6.—Epigynum of *L. coloradensis*.
- Fig. 7.—Palpus of same.
- Fig. 8.—Epigynum of *L. lenta*.
- Fig. 9.—Palpus of same.

PLATE XIX.—COPULATORY ORGANS OF SPECIES OF LYCOSA (CONTINUED).

- Fig. 1.—Palpus of *L. albohastata* (type).
- Fig. 2.—Epigynum of *L. fumosa* (type).
- Fig. 3.—Palpus of same (type).
- Fig. 4.—Palpus of *L. beani* (type).
- Fig. 5.—Epigynum of same (type).
- Fig. 6.—Palpus of *L. pictilis* (type).
- Fig. 7.—Epigynum of *L. quinaria* (type).
- Fig. 8.—Epigynum of *L. pictilis* (type).
- Fig. 9.—Epigynum of *L. rubicunda*.

PLATE XX.—COPULATORY ORGANS OF SPECIES OF LYCOSA (CONTINUED).

- Fig. 1.—Palpus of *L. avara*, side view.
- Fig. 2.—Epigynum of same.
- Fig. 3.—Palpus of same, ventral view.
- Fig. 4.—Epigynum of *L. avara* var. *gosiuta*.
- Fig. 5.—Palpus of *L. cinerea*.
- Fig. 6.—Epigynum of same.
- Fig. 7.—Palpus of *Allocosa parva*.
- Fig. 8.—Epigynum of *L. fatifera*.
- Fig. 9.—Epigynum of *L. arenicola*.

PLATE XXI.—COPULATORY ORGANS OF SPECIES OF LYCOSA (CONTINUED) AND OF SPECIES OF PIRATA.

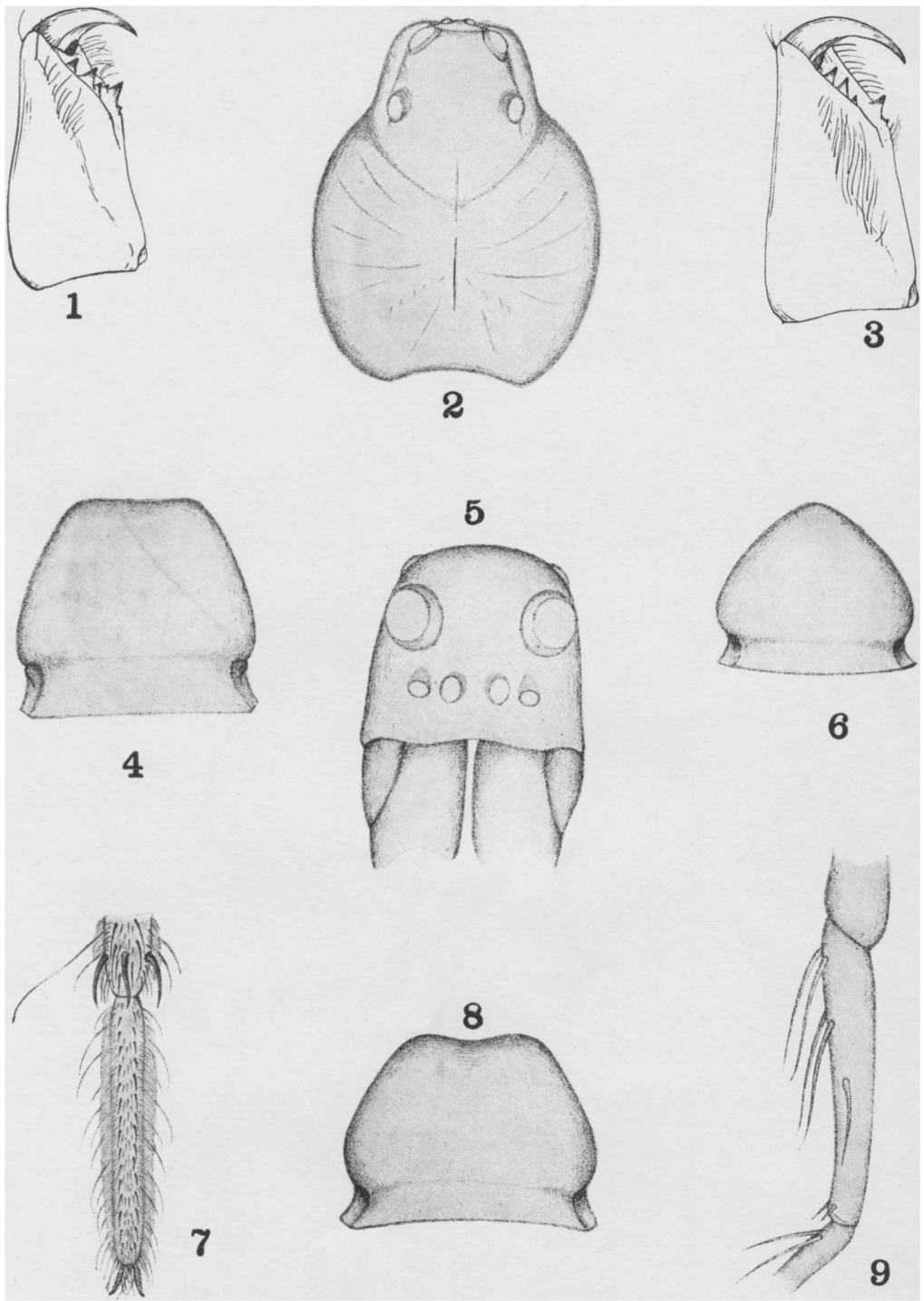
- Fig. 1.—Epigynum of *L. carolinensis*.
- Fig. 2.—Palpus of same.
- Fig. 3.—Epigynum of *L. pratensis*.
- Fig. 4.—Palpus of *L. kochii*.
- Fig. 5.—Epigynum of same.
- Fig. 6.—Palpus of *L. gulosa*.
- Fig. 7.—Epigynum of same.
- Fig. 8.—Palpus of *P. marxi*.
- Fig. 9.—Palpus of *P. minutus*.

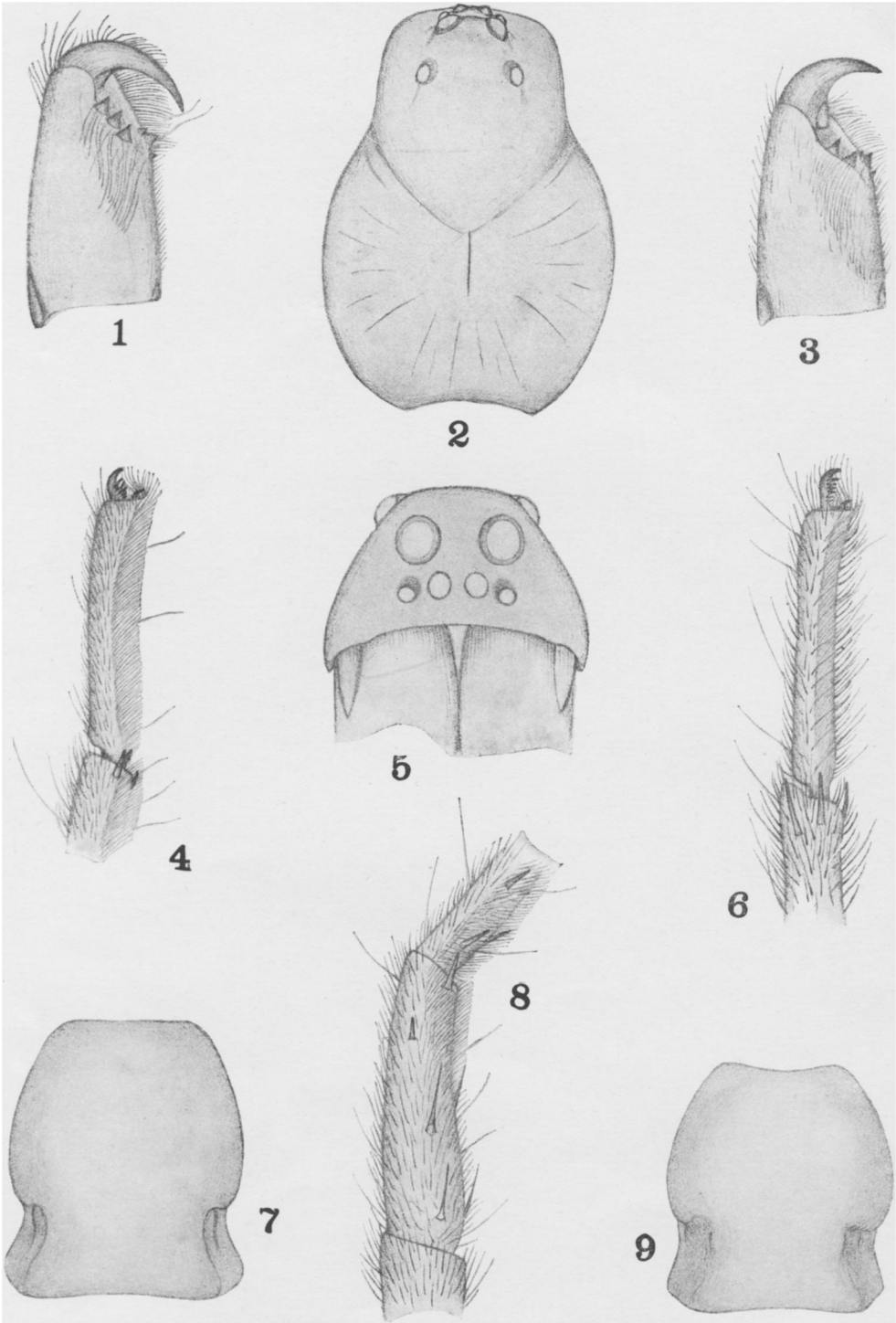
PLATE XXII.—COPULATORY ORGANS OF SPECIES OF PIRATA (CONTINUED).

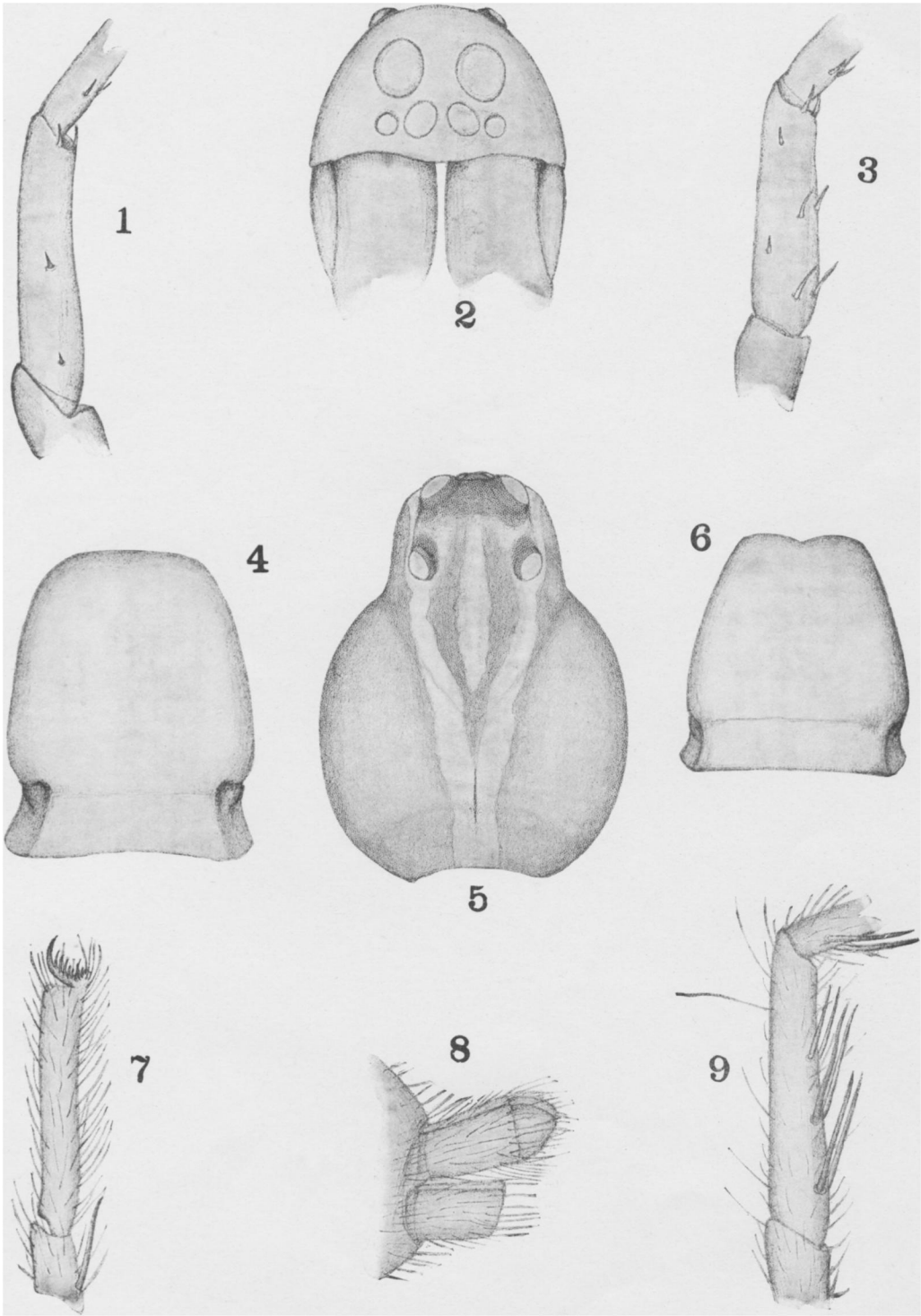
- Fig. 1.—Palpus of *P. febriculosa*.
- Fig. 2.—Epigynum of same.
- Fig. 3.—Palpus of *P. insularis*.
- Fig. 4.—Epigynum of same.
- Fig. 5.—Palpus of *P. aspirans*.
- Fig. 6.—Epigynum of same.
- Fig. 7.—Epigynum of *P. minutus*.
- Fig. 8.—Epigynum of *P. marxi*.
- Fig. 9.—Epigynum of *P. montanus*.

PLATE XXIII.—COPULATORY ORGANS OF SPECIES OF SOSIPPUS AND ALLOCOSA.

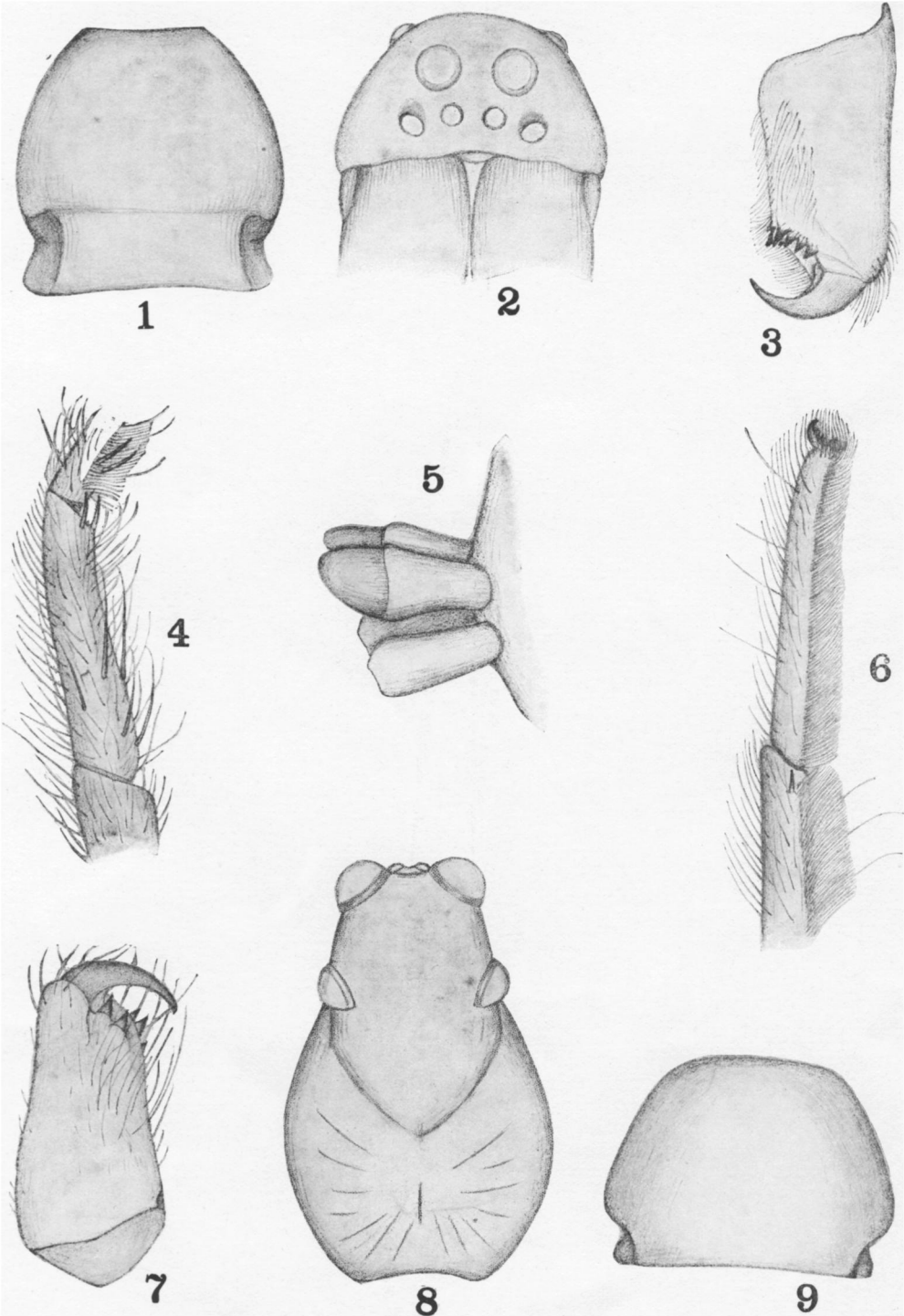
- Fig. 1.—Palpus of *S. floridanus*.
 - Fig. 2.—Epigynum of same.
 - Fig. 3.—Palpus of *A. rugosa*.
 - Fig. 4.—Epigynum of *A. evagata*.
 - Fig. 5.—Epigynum of *A. degesta* (that of *funerea* similar).
- (See also Pl. XX, fig. 7.)

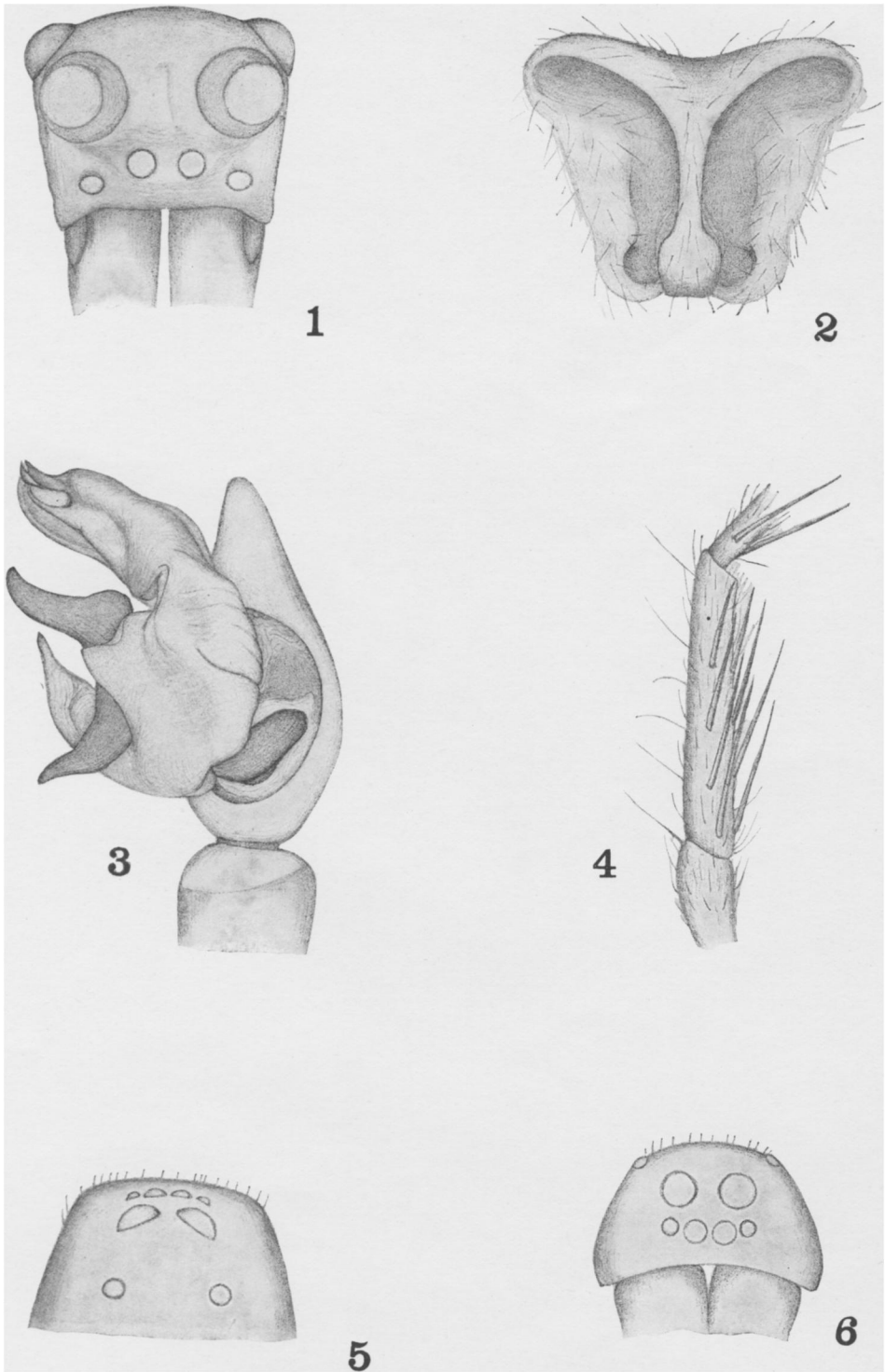


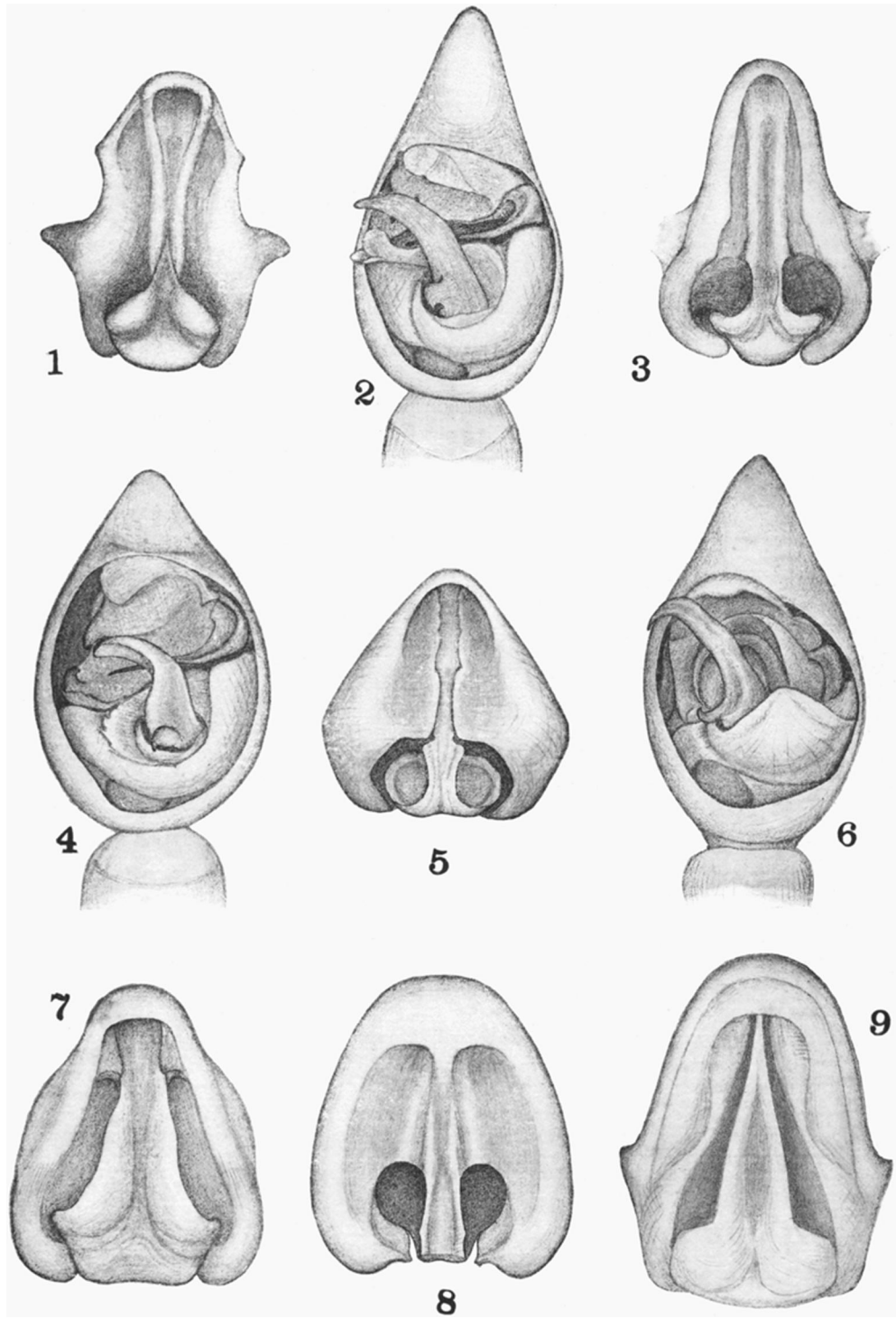




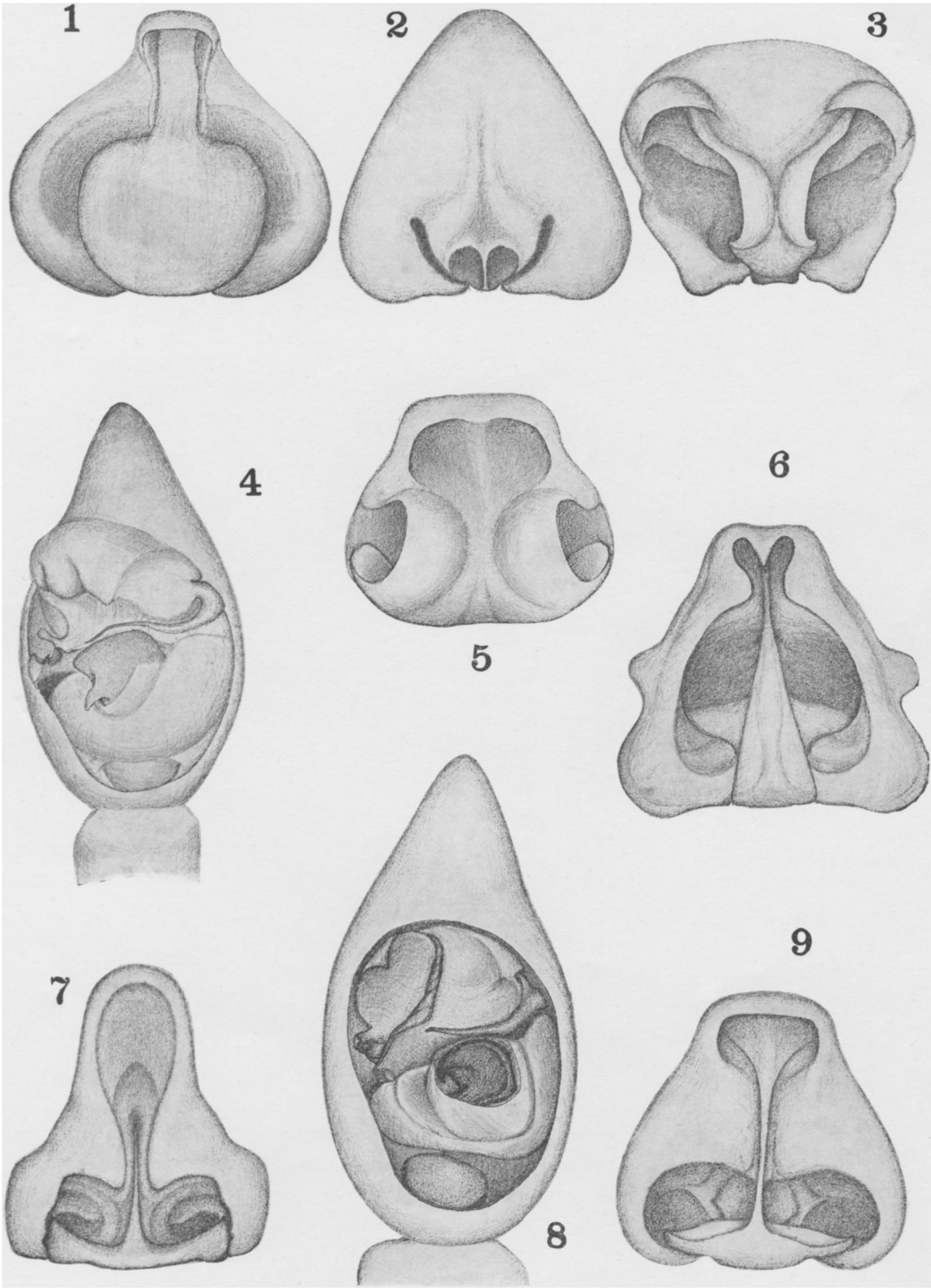
CHAMBERLIN ON LYCOSIDÆ.

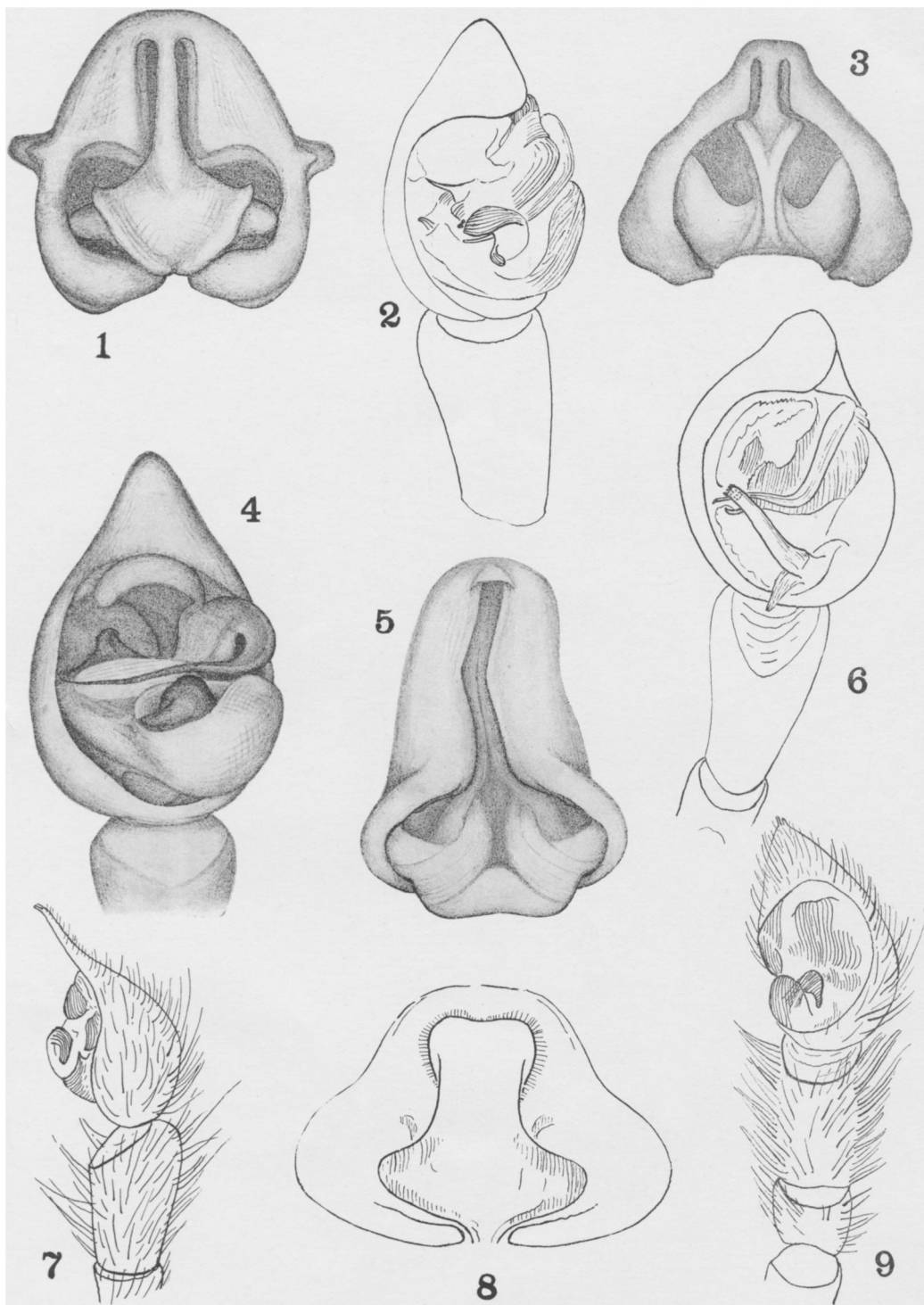




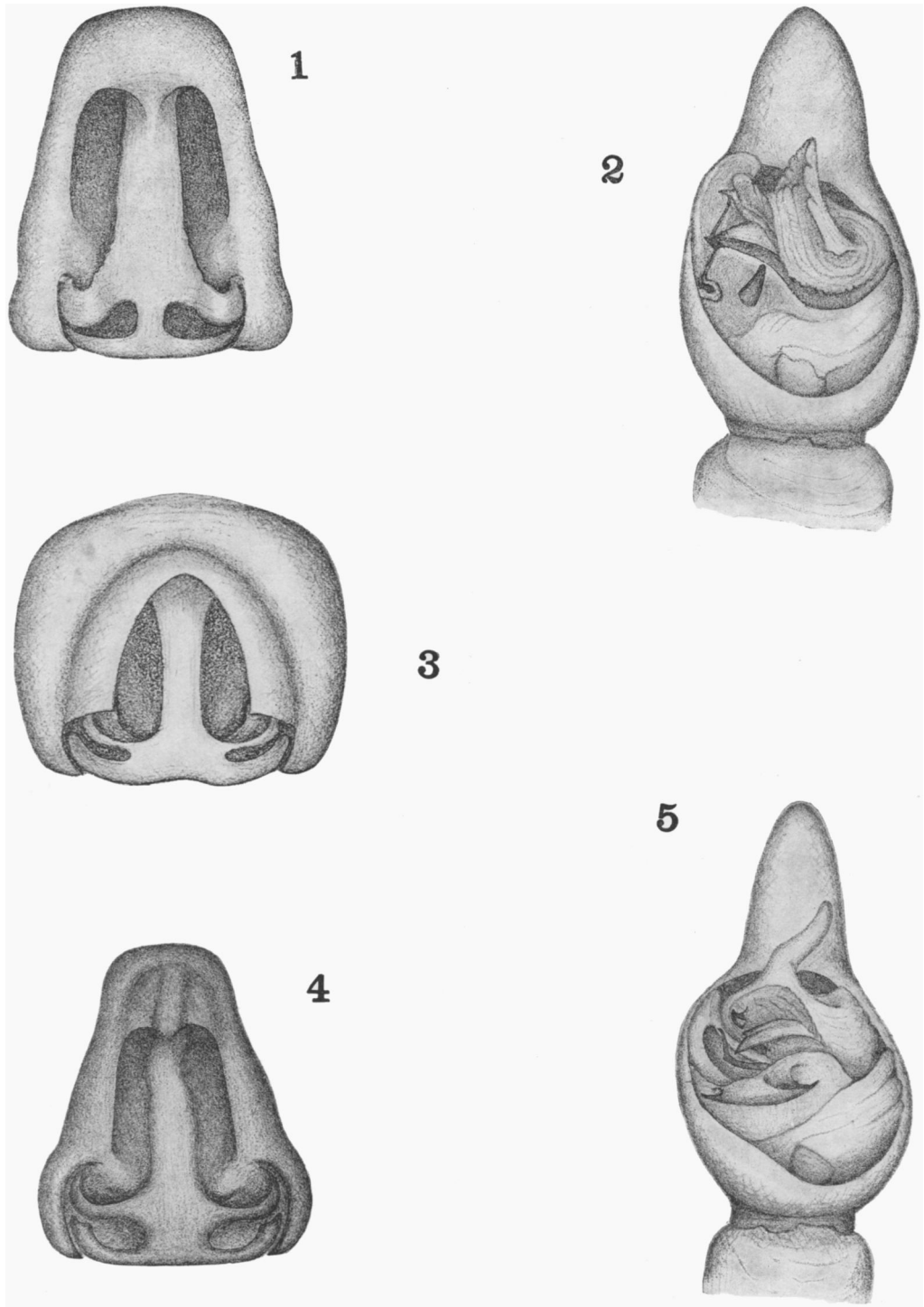


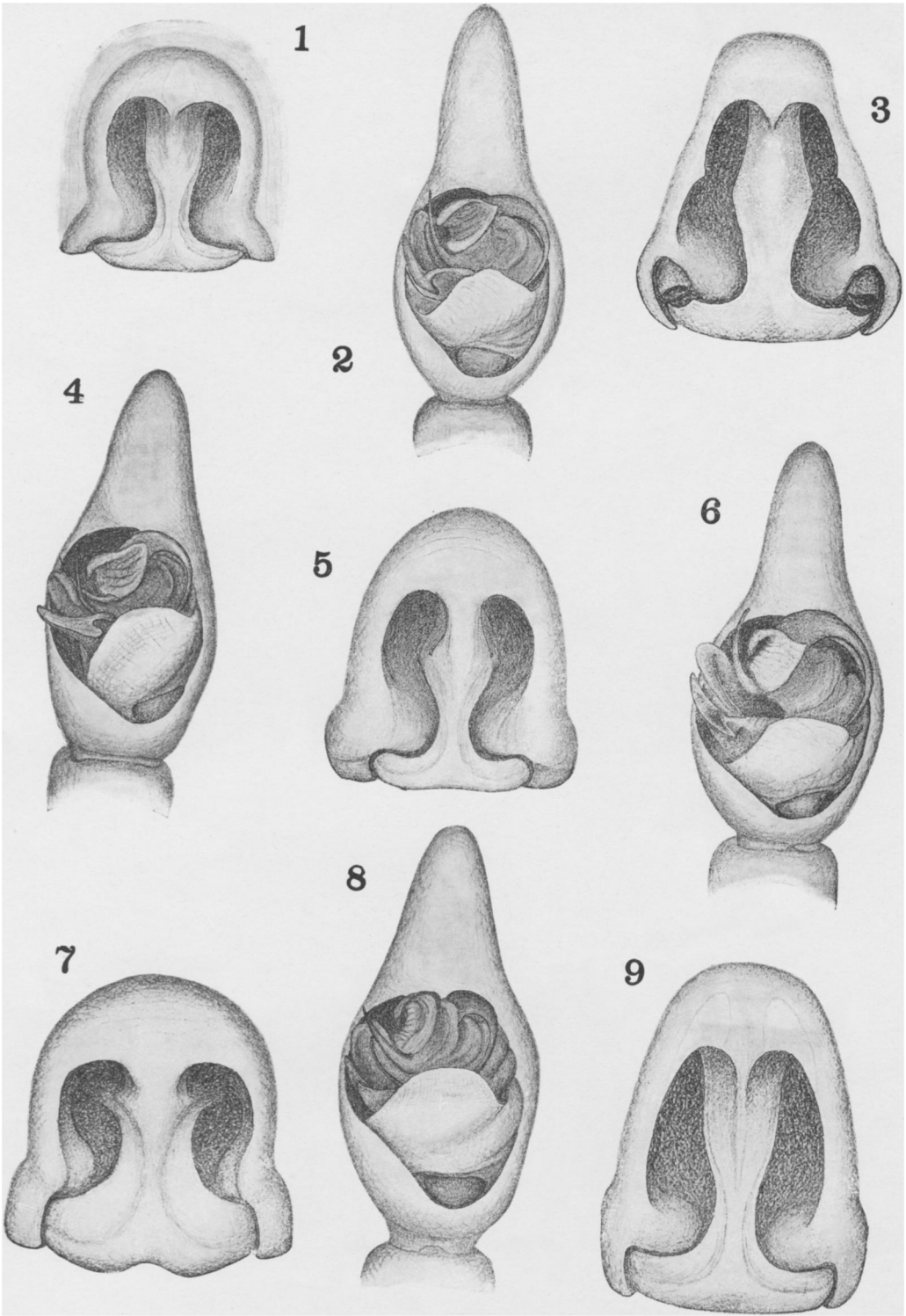
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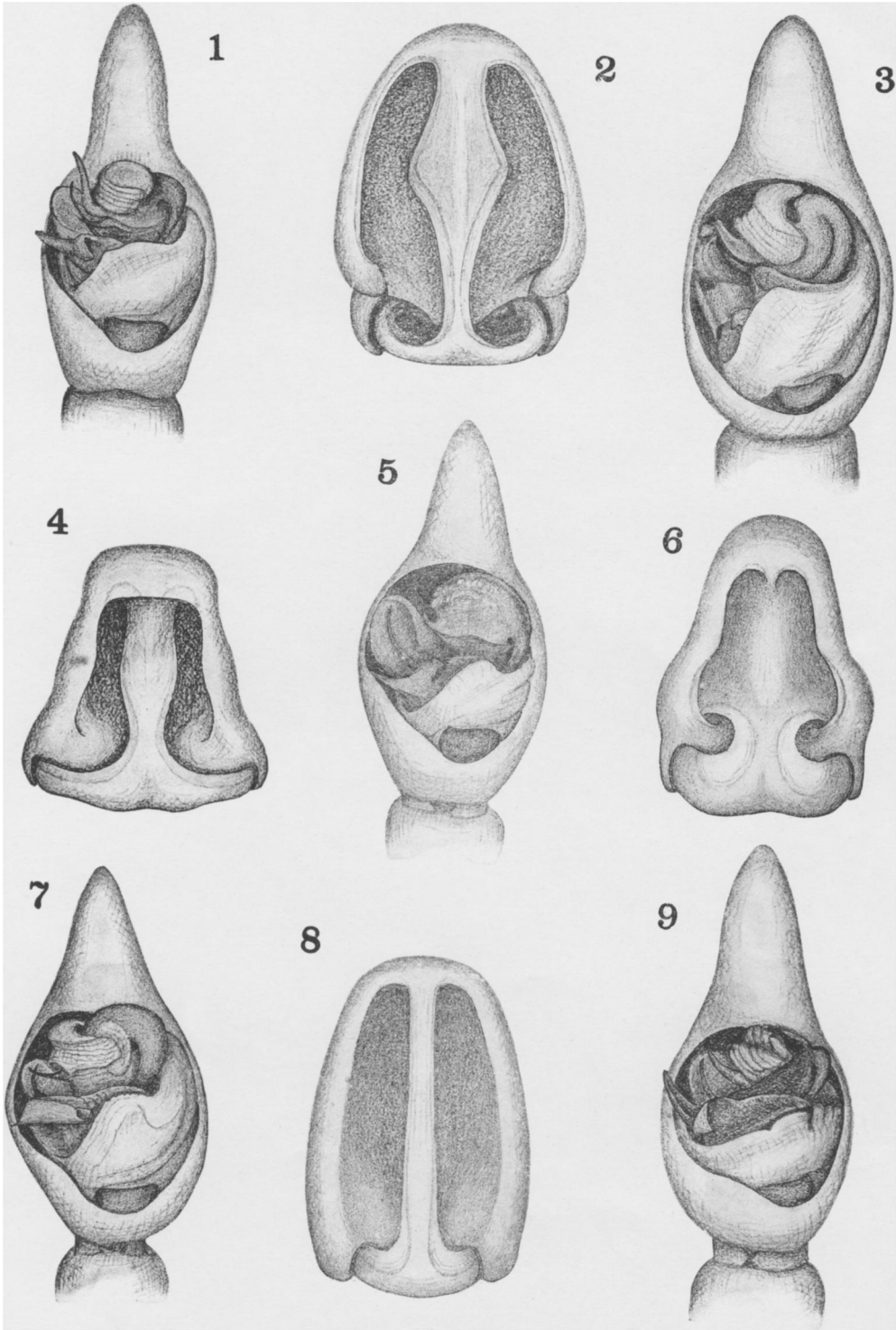


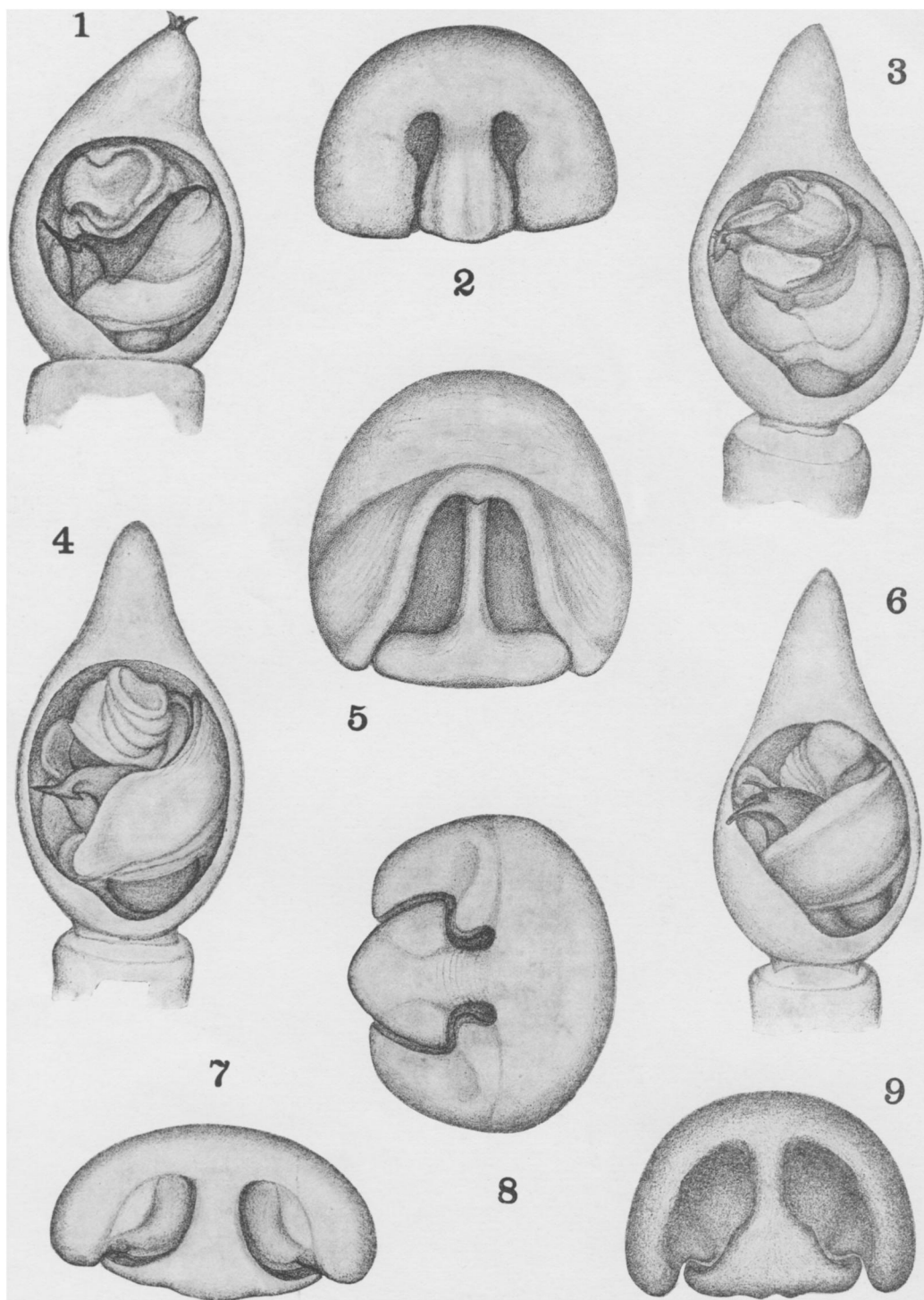


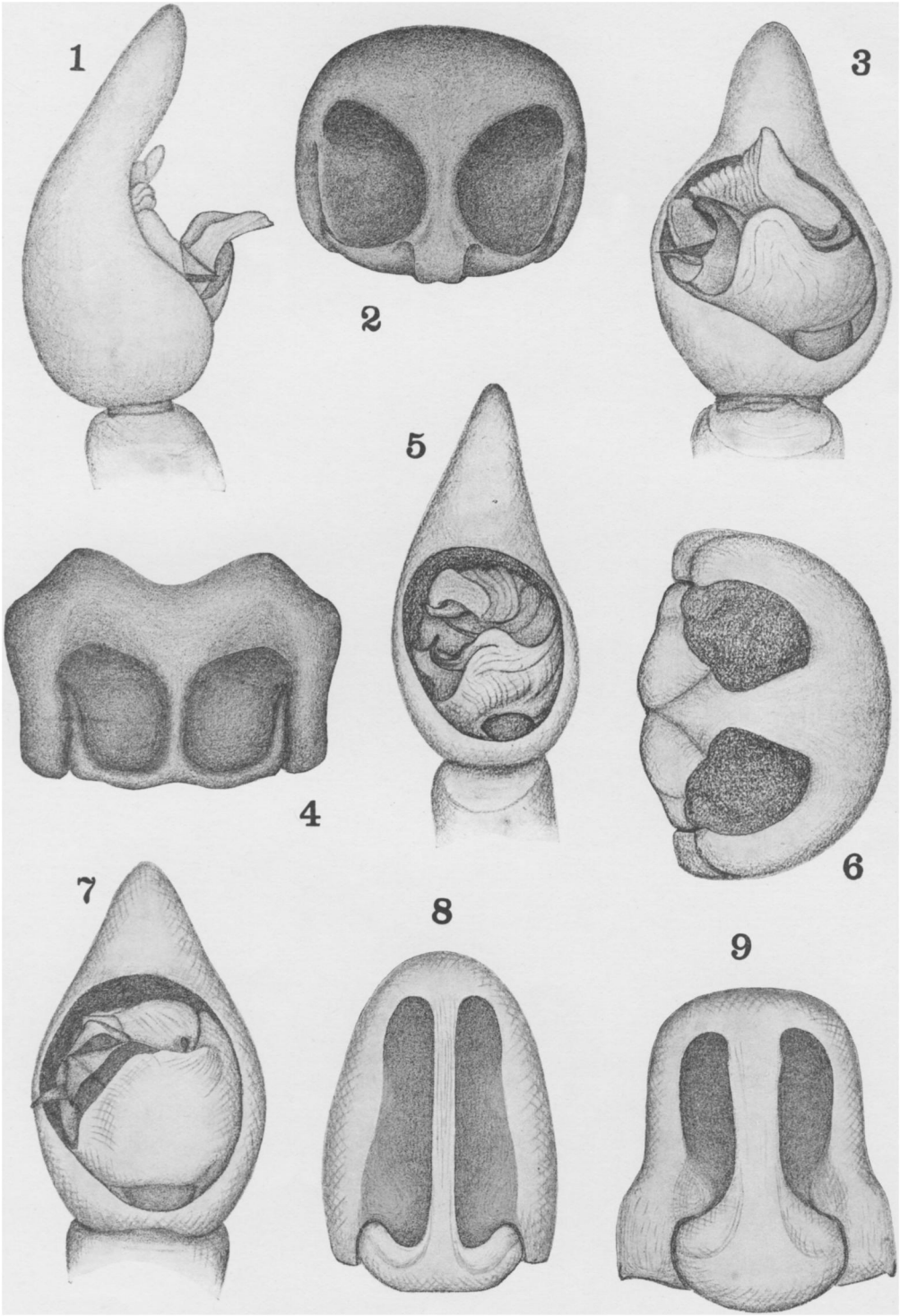
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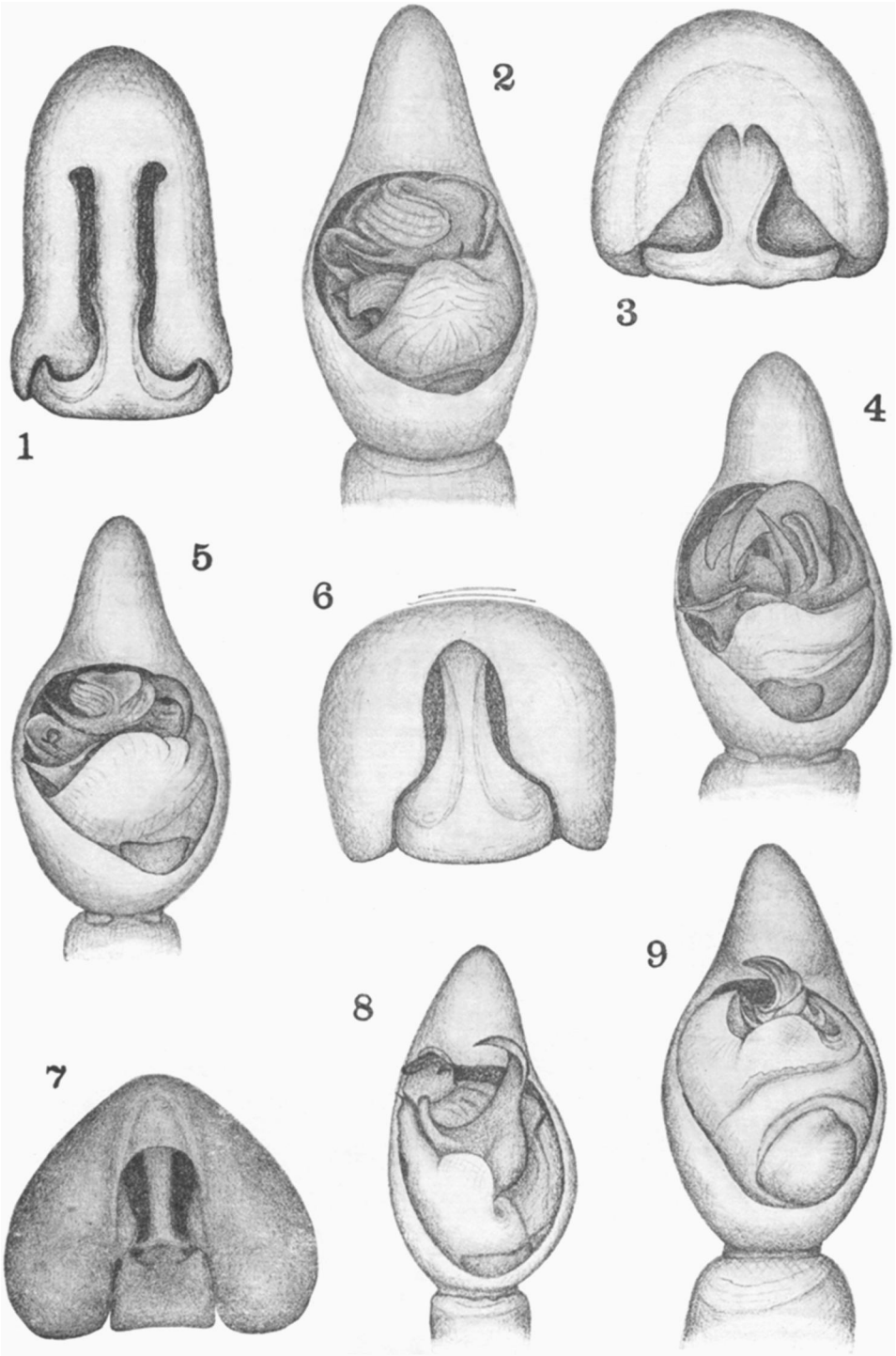


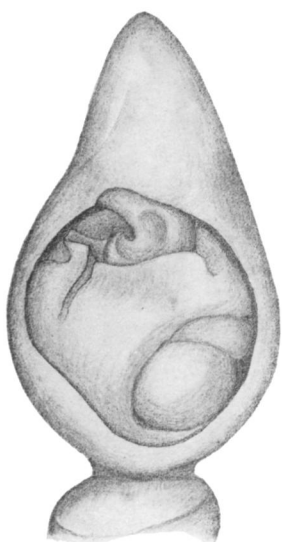






CHAMBERLIN ON LYCOSIDÆ.

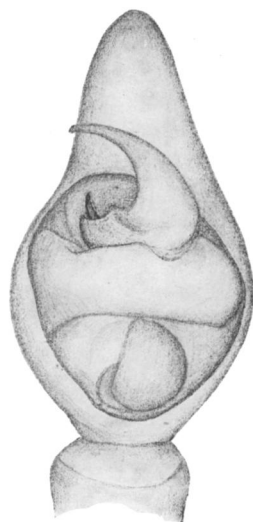




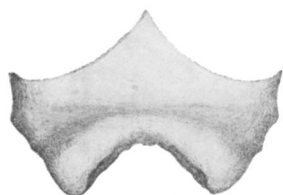
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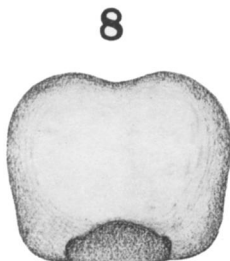
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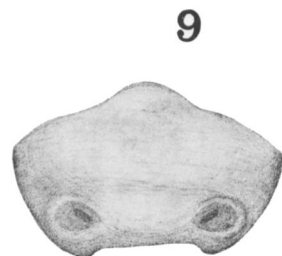
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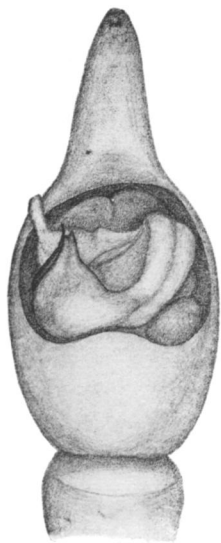
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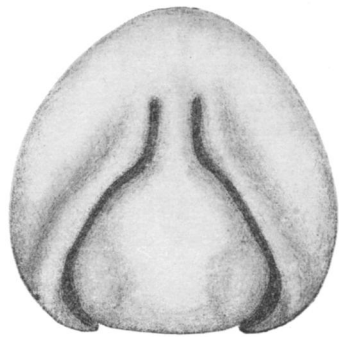
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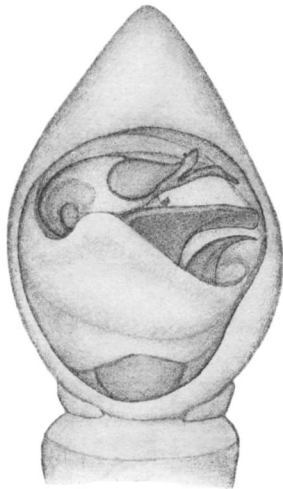
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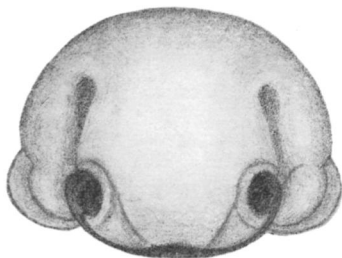


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